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A RATIONAL BASIS FOR DETERMINING FITNESS FOR COLLEGE ENTRANCE[1]

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The present practice of accrediting high schools in vogue in the Middle West raises the question: What should be regarded a fair basis for determining the fitness of high school graduates for entrance to college? Should it be a system of marks, absolute or literal, based upon oral or written tests or set examinations, or should it be a descriptive statement based upon the combined judgments of all the teachers stated qualitatively? The plan of accrediting high schools frankly accepts the judgment of the high school teacher as regards the fitness of her pupils to enter upon college work. On the other hand, it must be recognized that the teacher's judgment is a variable standard. It is influenced by personal equation, by the kind of marking system used, by the teacher's interpretation of the marking system, by the basis of the marks, whether examination, daily recitation, or otherwise, and sometimes by other factors than scholastic attainment, as deportment and general attitude of pupils. Teachers differ widely as to their conception of the dignity of the work required by the high school. Some emphasize the content, others the formal aspect of education, while often no account is taken of the variation in the mental constitution of the pupils. Furthermore, it should be borne in mind that by any system of marking based on achievement it is more difficult to apply the standard of grading to the bright and to the dull than to the mediocre pupils. The language of mediocrity is a common language which is easily interpreted. Precocity, on

[1] Communicated from the Department of Education, The State University of Iowa.

the other hand, is often an illusion, the real fact being covered up by a linguistic facility which is too often regarded as a mark of ability. Dullness is subject to the opposite illusion; the pupil that the teacher regards as dull may lack only the ability to express himself in the traditional, i. e., the mediocre way. Precocity and dullness are unique and require unique modes of expression. These the ordinary marking systems entirely overlook.

It is a fair question to ask whether, after all, those students in the high school who are classified as very good and excellent, or only fair and poor, will not maintain their relative standing in the university. Professor W. F. Dearborn[1] from a study of eight large and four small high schools of Wisconsin answers the question in the affirmative. He concludes that three-fourths of the students who enter the university from the high schools which he studied will maintain throughout the university approximately the same rank which they held in the high school. He says that there is no reason to believe that the standards prevailing in the university differ materially, if at all, from those maintained in the best high schools of the state. The fact that Professor Dearborn's investigation was concerned chiefly with the large high schools leaves out of consideration over 90 per cent of the students who enter college from the Middle West. This fact would seem a sufficient reason for making a further study in the direction which Professor Dearborn has so well indicated.

The object of the present study, however, is to consider the question which was raised at the beginning of this paper.

The data were obtained from the office of the Registrar of the State University of Iowa and consisted of the high school and university marks of 120 Liberal Arts students, graduates of 1910. About 40 members of the class were rejected because their high school records were incomplete or not on file.

The various systems of marking made use of in different high schools and in the University had first to be equated. The following method of equating was adopted as corresponding as nearly as possible to the normal curve of distribution. The scheme will be seen best if viewed in parallel columns.

High school	University	
E = 97		A = 97
G = 91	A = 95	B = 91
M = 85	B = 85	C = 85
P = 79	C = 75	D = 79
F = 73		E = 73

[1] Bulletin of the University of Wisconsin, No. 368.

In only a very few cases do we find absolute values above 97% or below 75%. It would seem, therefore, that the above distribution compares fairly with the system of marks used by a majority of the high schools. The important fact is that the average grade is the same for all three of the numerical systems, and that the distribution is based upon the normal curve. It should be added that the grades have no intrinsic value in this study. All correlations are based on Pearson's rank difference method (cf. Whipple. "Mental and Physical Tests," p. 32.). Likewise, the distributions both in the high school and in the university are according to rank. The students in the high school were ranked on the basis of their average marks for the entire course in all subjects. The same students were then ranked on the basis of their average university marks. They were also ranked in successive years in the high school and in the university, and likewise in the various specific subjects.

When all the pupils have been ranked on this basis the rank numbers are arranged along a horizontal line, each number standing above the grade to which it corresponds. The order of rank is from the base line up and from right to left. In comparing the high school and university distributions it should be remembered that the same rank numbers are retained in the latter distribution as were received in the former. Thus it will be seen (Figures 1 and 2) that the pupil who ranked 1 in the high school is numbered 1 in the university, but to find his rank it is necessary to count from the extreme right to the position occupied by number 1. This is seen to be 5. Hence the pupil who ranked 1 in the high school ranked 5 in the university. Likewise, the pupil who ranked 120 in the high school ranked 81 in the university. When the ranks have been thus distributed, each group is divided into five sub-groups or quintiles of 24 pupils each.

This method was thought to offer certain advantages over the quartile method of subdividing. It is obvious, as Professor Max Meyer points out, that nothing is to be gained by subdividing the medium group. Appropos of this subject he says:

"Little can be said in favor of subdividing the medium group. That this group is the largest is no reason for subdividing it. A strong argument against subdividing is the fact that this would bring about unjust grading of a large number of students. The curve is highest for medium ability. If we divide the area by a vertical line, we must have a large number of students on one side differing by an almost infini-

tesimal amount of ability from a large number on the other side."

Now by the quartile method the medium group is divided through the middle and is therefore open to the Professor Meyer's objection. On the other hand, too few subdivisions leave too wide a gap between the sub-groups. Superior ability can not be separated from medium ability by a single line, nor can medium ability be thus separated from inferior ability. Hence, such a division while not doing violence to a great number does a relatively greater injustice to a few. The transition from superior to medium and from medium to inferior ability must each be through a zone in which may be found individuals from both contiguous groups. This the quintile method accomplishes.

It may be useful to point out, furthermore, that the degree of correlation or lack of correlation between two distributions is indicated not by movement within the medium groups, but from one extreme group to the other. Movement within the medium groups may indicate very slight change in absolute marking and may even be attended by an opposite sort of achievement. In the extreme quintiles the reverse is true. A slight change in position indicates a relatively large amount of change in absolute marking. Hence, attention should be directed to the pupils in the extreme quintiles. If a large percentage of the pupils in the highest and lowest quintiles in the high school grouping remain in the corresponding quintiles in the university grouping, the correlation may be regarded as high, and vice versa if a large percentage of the pupils in one extreme quintile in the first grouping should be found in the opposite quintile in the second grouping, the correlation should be regarded as low.

Now it is obvious that if a high degree of correlation is maintained between the high school and the university, the standards and methods of the former are not far different from those of the latter, and furthermore the methods of selecting those whom the college will accept is adequate to meet the demands of the college. The thesis which the present study upholds is that the teacher's judgment without regard to any marking system is the only logical criterion by which to determine the fitness of pupils for college entrance. That this criterion is often unreliable and that the teacher's judgment should be standardized is admitted. Furthermore, it is admitted that some marking system is desirable and perhaps necessary. It should be a rational system, based upon some simple formula of distribution. Perhaps an approximation to the normal curve offers the best basis for a rational

system. The best system is yet to be determined, and it will be determined only by standardizing the various methods now in vogue. And yet any system, however rational, is essentially mechanical. So long as the teacher is a slave to a system of marks there is no incentive to study the individual child. Once the teacher recognizes the principle that probably no class should ever conform exactly to an ideal formula of

80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
											71						
											70						
											69						
											68						
											67						
											66						
											65						
										84	65				27		
										83	63				26		
										82	62	51			25		
									94	81	61	50			24		
									93	80	60	49			23		
									92	79	59	48	40		22	14	
					115				91	78	58	47	39		21	13	
					114	109			90	77	57	46	38		20	12	6
					113	108		99	89	76	56	45	37	32	19	11	5
			119		112	107	103	98	88	75	55	44	36	31	18	10	4
			118		111	106	102	97	87	74	54	43	35	30	17	9	3
			117		110	105	101	96	86	73	53	42	34	29	16	8	2
120			116		109	104	100	95	85	72	52	41	33	28	15	7	1

Fig. 1. Distribution of high school rankings on the basis of the general average.

73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
														38							
														83	86						
														113	24		13				
														81	100		105				
													45	98	2		21	55	30		
												94	69	23	52		50	65	57		
												73	72	114	85		71	47	12		
												84	49	90	36	66	46	89	32	4	
											33	80	68	110	99	116	27	53	7	19	
										26	117	118	76	108	44	22	93	87	74	29	18	1
										102	109	101	104	64	96	39	95	35	62	41	40	97
									103	60	70	91	77	120	17	37	20	34	31	25	11	10
								111	75	43	15	67	82	42	63	61	92	5	14	59	16	9
79				119			112		51	115	48	6	107	106	88	56	78	28	58	54	8	3

Fig. 2. The same group according to the university distribution.

marks she has a motive for interpreting the standard from every possible view point of the child. The marking system should be merely a convenient mode of expressing the teacher's judgment which should be as little hampered as possible. The view that the judgment of the teacher is on the whole a reliable criterion by which to determine the fitness of pupils

for college entrance is shown by the facts brought out in the present study.

On the basis of the general averages in the high school and in the university it is seen (Table I, figs. 1 and 2) that more

TABLE I

DISTRIBUTION BY QUINTILES

General Averages

UNIVERSITY

High School	1st q. %	2d q. %	3d q. %	4th q. %	5th q. %
1st q.	54	16.6	16.6	4	8
2d q.	25	29	16.6	12.5	16.6
3d q.	16.6	25	21	21	16.6
4th q.	0	25	25	33.3	16.6
5th q.	4	4	21	29	42

than one-half (54 per cent) of the pupils who were in the first or highest quintile in the high school grouping remain in the corresponding quintile in the university grouping, and that somewhat less than half (42 per cent) of those in the fifth or lowest quintile in the high school grouping are in the same quantile in the university grouping. Furthermore, 29 per cent of those in the first quintile are in the upper half of that quantile, while only 16.5 per cent of those in the lowest quintile are in the lower half of that quintile. That is, 12.5 per cent more pupils move up from the lowest positions in the high school to relatively higher positions in the university than move down from the highest to relatively lower positions.

If we divide the groups into two equal parts instead of five and then proceed as before to compare the pupils' standing in each half of the high school grouping with their standing in the corresponding half of the university grouping, the result is almost exactly identical with that found by Professor Dearborn in the larger high schools of Wisconsin. To be exact, 71.6 per cent of those who were in the first half of the high school grouping remain in the same half of the university grouping, and 70 per cent of those in the second half of the former grouping remain in the corresponding division of the latter grouping. Professor Dearborn is doubtless correct when he says, "The correlation between standings in the high school and in the university is even closer than this rough method would seem to indicate, because ..... a change of a single grade or so near the median or dividing line between the two halves, if made by a number of individuals, would influence the composition of the two groups, materially. And it

is likely that this frequently occurs because the majority of pupils in these distributions are centered about the median."

Equally strong evidence of the comparative stability of the two groupings is to be found in the fact that only one pupil moved up from the lowest quintile in the high school to the highest quintile in the university, and only two of those who were in the highest division in the high school were in the lowest division in the university.

Table II and figures 3, 4, 5, and 6 represent respectively the ranking of pupils in the freshman, sophomore, junior, and senior years in the university as compared with their general average high school standing (fig. 1). It will be seen that the per cent of those who are in corresponding quintiles in successive years in the university as compared with the general average in the high school is about the same as that for the general average in the university. The per cent of those who change from one extreme quintile in the high school to the opposite quintile in the university is also correspondingly low. It may be of interest to note that in the freshman and junior years 40 to 55 per cent of those in the extreme quintiles in the high school grouping are in the corresponding quintiles in the university groupings, while in the sophomore and senior years only 25 to 41 per cent remain in the same division in the latter as in the former grouping. The significance of this fact will be considered later.

Another method of comparing the standing of these pupils consists in showing their relative distribution from year to year through the high school and the university. The pupils are ranked on the basis of the average grade for each year. The principle of distribution which was made use of in the case of the general averages is applied in this case. The rank

											66										
											114										
											101										
											2										
								86			77										
								73			99										
								118		84	58		87								
								43		100	55		49								
								104		76	17		90	52							
								72		56	94		57	93				46			
								94		108	13	105	83	4		62		65	41		97
								42		64	88	38	35	117		71		1	10		74
					48	80	6	63	116	15	120	98	20	34	32	29		19	18	9	16
		119	92		33	70	109	60	69	110	47	96	91	36	50	24	40	11	8	14	28
51	102	67	111		113	45	115	78	68	82	44	39	61	30	54	12	27	31	89	7	5
74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95

FIG. 3. Showing the distribution of ranks in the freshman year of the university as compared with the general average in the high school.

									96			41						
									90			13						
									27			87						
									94			29						
									22			55						
								38	98			78		4				
						120	42	2	88	86			18		32			
					15	64	108	118	52	36	28		92		10			
					85	73	44	17	117	68	20		7		19			
					80	101	63	56	48	24	30		1		89			
					67	110	95	83	113	12	50		62		11			
	115		111	77	6	46	109	69	81	93	66		35		57			25
	43	51	49	76	99	116	114	72	5	71	31	74	85	54	40		58	16
119	33	102	60	91	70	100	104	45	39	61	105	14	8	65	34	47	97	9
77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95

FIG. 4. Showing the distribution of ranks in the sophomore year as compared with the general average in the high school.

											42									
											66									
											64									
											86									
									68		34									
									93		44			105						
									39		38			14						
									76		49	37		27						
									107		100	22		35						
									28		109	113		21				54		
						118			52		117	46		41				19		
						115			24		106	50	85	56		25		29		8
						104	77	82	80		2	90	63	110		40		20		3
						73	115	26	88		45	92	89	5	57	32		10	55	1
				43	111	99	102	61	120		81	87	31	65	114	9		30	53	12
				72	60	33 116	108	83	51	6	67	74	69	95	71	16		62	58	11
	119		101		70	94	98	96	36	91	84	48	17	47	78	7	13	97	18	4	59
	75	76	77	78	97	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95

FIG. 5. Showing same distribution for the junior year.

													82							
													62		25					
													42		61					
												70	80		91					
												59	110		7					
												92	109		88					
												50	27	97	96					54
												73	63	21	55	18				99
										60	45	64	14	58	98	78				46
										90	20	49	67	13	44	86	74			9
										51	89	5	100	52	11	28	12	72		57
										6	114	43	48	77	35	117	93	32		1
								69		24	38	22	16	17	34	105	56	29		40
		26		85				15		84	76	101	83	36	3	19	8	47		10
		112		103	108			106	107	23	68	81	37	71	33	120	113	87	41	4
120		111	119	75	116			94	118	53	115	65	102	104	39	2	31	66	95	30
73		79	80	83	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97

FIG. 6. Showing same distribution for the senior year.

TABLE II

Distribution by Quintiles

High School, General Average. University by Years

UNIVERSITY

High School	1st q. %	2d q. %	3d q. %	4th q. %	5th q. %
Freshman Year					
1st q.	55	20	15	5	5
2d q.	24	33	19	5	19
3d q.	4.5	27	18.5	36.5	13.5
4th q.	10	15	30	25	20
5th q.	5	5	20	30	40
High School — Sophomore Year					
1st q.	33	28.5	19	9.5	9.5
2d q.	26	22	22	17	13
3d q.	24	24	14	14	24
4th q.	9.5	19	33	14.5	24
5th q.	5	5	15	45	30
High School — Junior Year					
1st q.	54.5	23	13.5	9	
2d q.	17.5	22	30	17.5	13
3d q.	23	23	19.5	23	11.5
4th q.	0	19	19	38	24
5th q.	4.5	13	21.5	8.5	52.5
High School — Senior Year					
1st q.	25	25	21	12.5	16.6
2d q.	29	25	25	16.6	4
3d q.	21	12.5	16.6	33.3	16.6
4th q.	21	16.6	16.6	25	21
5th q.	4	16.6	21	16.6	42

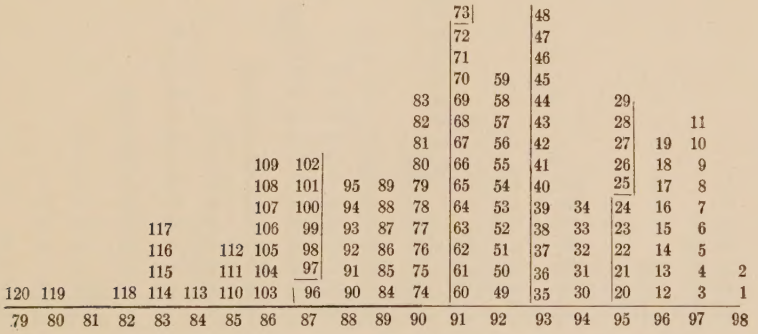

Fig. 7. Distribution of first year high school ranks.

														79				
													28	31				
													56	4				
											1		24	10	19			
										37	3	96	27	13	7			
										89	72	52	51	26	15			
						85	106			100	53	84	60	25	87			
						114	77	35		61	71	38	43	8	2			
						98	94	70		57	75	66	49	12	14			
						105	104	45	34	99	59	32	41	21	22			
				101	118	76	97	82	58	91	55	95	42	48	99	20	17	
				102	120	119	92	23	86	63	110	47	4	50	29	46	16	
		93	116	80	73	83	108	112	88	78	67	36	54	65	62	30	5	11
113		111	115	117	107	68	105	90	69	81	40	64	74	109	18	33	9	6
80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98

FIG. 8. Same group according to second year high school distribution.

											52								
											42								
											45								
										110	75								
										94	63								
										6	37	36							
										35	1	61							
										59	72	99		87					
							91			79	64	34		4	24				
							103	92		53	40	43		14	26	13			
							116	54		78	71	84	66	65	21	12			
							104	27	81	58	69	44	48	10	46	33			
							70	60	117	68	55	100	111	51	73	9			
						3	89	98	105	97	106	74	47	32	20	22	7		
						102	101	23	41	49	56	95	31	28	2	8	16		
			114	115	108	57	118	109	88	80	86	30	19	51	25	29	5	18	
120	113	112	85	76	107	119	93	82	38	83	90	96	67	77	50	39	15	17	11
78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97j

FIG. 9. Same group (fig. 7) according to third year high school distribution.

											53								
											81				87				
											41				3				
										114	37	80			74				
										55	36	42			51	52			
										56	72	61			10	25			
						117			27	35	60	90	111	62	90	28			
						102		100	110	45	77	104	95	39	30	4			
				115		108		58	79	67	71	6	48	59	81	2	7		
				85		118		1	40	82	38	64	43	65	31	5	21		
				57		70		96	66	97	106	34	32	94	26	86	16		
				76		88	116	49	63	103	92	24	44	22	19	8	17	33	
		119		89		113	73	101	107	78	47	109	50	54	14	12	9	13	
120		93		112		23	98	105	83	68	91	69	46	20	15	29	11	18	
80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	

FIG. 10. Same group (fig. 7) according to fourth year high school distribution.

											72										
											116										
											103										
								100			9										
								77			53										
								115		89	95										
								42		27	29		56								
								101		78	4	36	61	41							
								52		68	88	107	82	16					34		
								35		66	57	44	51	83					55	47	104
								38		92	94	70	25	119	40	28			11	15	63
					64	60		75	93	85	69	43	23	48	50	45			33	20	8	22
		113	106		32	58	81	90	99	87	120	80	110	65	86	10	74		14	2	21	31
3	98	71	114		118	54	112	97	79	96	59	111	49	46	67	13	30		6	91	12	17
74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95

Fig 11. Same group (fig. 7) according to freshman university distribution.

											30			47							
											82			29							
											111			11							
											97			28							
											26			110							
										44				95			16				
							87		36	9	94	12		57			50				
							68	120	52	35	119	83	31	67			15				
							71	103	88	115	64	45	40	80			14				
							58	77	38	4	41	49	46	13			91				
							5	85	92	66	118	48	25	90			33				
			112		56	69	96	34	116	99	81	100	72	20		61				24	
			42	3	114	78	60	93	101	23	43	79	6	21	73	86	74	27	53	22	
		113	32	98	75	106	57	89	108	54	17	10	107	63	2	55	65	59	104	8	
		77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	

Fig. 12. Same group (fig. 7) according to sophomore university distribution.

												52									
												72									
												27									
												100									
												65									
											79	44									
											83	26			107						
											43	36			21						
											78	56			30						
											117	89	62		51						
											31	108	118		47				86		
								115			41	119	34		85				14		
								112			10	105	40	73	17		24		28		2
								101	69	96	58	9	82	38	66		74		25		18
						60		77	87	39	94	54	110	91	55	61	50		15	95	12
						114		57	98	49	120	81	80	6	7	116	8		46	109	33
					42	75	32	93	92	23	3	5	71	63	99	88	45		22	67	53	84
113			103		35	97	70	111	48	106	68	64	4	59	90	13	29		104	20	16	11
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	94	93	95	

Fig. 13. Same group (fig. 7) according to minor university distribution.

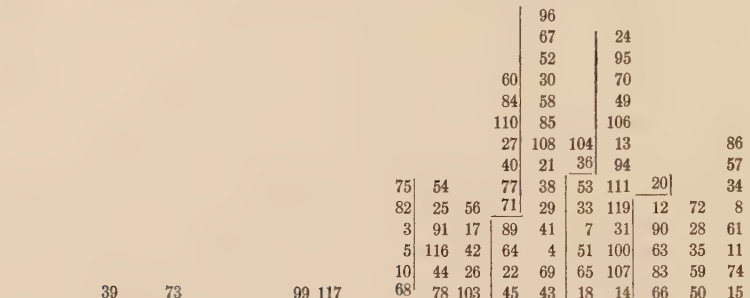

FIG. 14. Same group (fig 7) according to senior university distribution.

numbers which were received in the first year in the high school are retained throughout the high school and university courses. In this way it is possible to trace the standing of each pupil from the time he enters the high school until he graduates from the university (Table III, and figures 7, 8, 9, 10, 11, 12, 13, and 14).

This, it must be admitted, is a more rigid test of correlation than the two previously described. To maintain a given standing year by year throughout the high school and university courses is a better indication of high correlation than to maintain the same standing on the basis of the general average. In this as in the other comparisons the extreme positions are of special significance. The per cent of those who remain in the same quintile in successive years is shown in table III. Just one-fourth of the pupils who enter the high

TABLE III

DISTRIBUTION (BY QUINTILES) OF FIRST YEAR HIGH SCHOOL PUPILS THROUGH THE HIGH SCHOOL AND THE UNIVERSITY

Year	High School				University			
	1 %	2 %	3 %	4 %	1 %	2 %	3 %	4 %
1st q.	100	70	67	67	52	36	43	25
2d q.	100	54	33	29	35	33	22	8
3d q.	100	41	37	21	35	20	22	21
4th q.	100	29	25	21	48	28	17	25
5th q.	100	59	59	50	45	32	39	37.5

school as superior students graduate from the university in the same group. A few more, 37.5 per cent, who were ranked as inferior students in the first year of the high school remain in the lowest group in the senior year of the university. On the whole, there is more fluctuation of first quintile than of

fifth quintile pupils. The loss from the first quintile between the fourth year in the high school and the freshman year in the university amounts to 22 per cent, while only 10 per cent move up from the lowest quintile in the same period. The sophomore year in the university is unique. Fewer pupils remain in the first, third, and fifth quintiles than in any other year. The senior year also represents a relatively low percentage of those remaining in first and fifth quintiles. This corresponds to what was found with reference to correlation between the general average in the high school and successive years in the university.

The general uniformity of standings through the four years of the high school course as contrasted with standings in successive years in the university is significant. The fact that these students are from small high schools where, in many cases, the school is represented by a single student is also significant. The conclusion which is forced upon one's attention is that whatever difference exists between the marking of pupils in the high school and in the university is in the direction of greater reliability of high school marks. That the standard of marking as it is interpreted by individual teachers should be more uniform in the high school than in the university is not surprising when we consider that the high school teacher comes in closer touch with her pupils than it is possible for the university instructor to do. The latter must depend largely upon the written work of the student for his marks, while the former marks upon the broader basis of personal intercourse through oral recitations, reports, and general attitude, using the written exercise as a means of checking up the personal judgment. Even the written work of the high school student is likely to be better supervised than is the same work in the university.

The break between the high school and the university is the inevitable outcome of the readjustment that accompanies the taking of the next higher step. It corresponds to the declination in the learning curve which often precedes the organization of higher intellectual processes. Just as the "stages of arrest in learning should be avoided if possible"[1] so the break between any type of school and the type next above it should be reduced to a minimum.

The sophomore and senior years present a striking contrast to the freshman and junior years in the university in that a relatively small percentage of pupils remain in quintiles corresponding to those in the first high school year. The low percentages in the sophomore year must not be taken as an

[1] Colvin, S. S. The Learning Process, p. 43.

indication of a low degree of correlation between this and the freshman year. It should be interpreted just the opposite. That is, a high degree of correlation exists between the freshman and sophomore years which indicates that those who stand high in the freshman year also stand high in the sophomore year, and vice versa. But the cause which produced the low correlation between the first year high school and the freshman university cannot be the same as that which brought about the low correlation between the first year high school and the sophomore university. The sophomore year marks the real beginning of readjustment. It is the time when the student is first thrown largely upon his own resources. With the privilege of electing a large portion of his course comes the consciousness of conflicting interests which often interfere with the student's best effort.

Another cause of this low correlation is the fact that the sophomore year is distinguished from the freshman by the greatly increased number of lecture courses offered. These two causes operating together make the sophomore year a critical period in the university.

The junior and senior standings are to be explained on the same general principle. The junior year marks a period of relative adjustment between the student and university methods. The student has found himself, so to speak, and has thus recovered to a certain degree his normal standing in the original group. Two forces operate to cause the fluctuation in the senior year. The senior year marks the culmination of specialization in undergraduate courses. The number of different courses pursued in the freshman year was 4.5. In the sophomore year it was 3.8, in the junior, 3.5, and in the senior, 2.5. A high degree of specialization is accompanied by a correspondingly high degree of individual variation which accounts in part for the fluctuation of standings at this period. A contributing factor is to be found in the fact that the senior year is apt to be a period of diminished effort. In the present study it was observed with surprising frequency that a student who had maintained a high standing during the first three years in the university dropped to a low standing in the last year. The point to be emphasized is that the causes of fluctuation in the university are peculiar to conditions in the university and not to the unreliability of high school standards to meet college entrance requirements.

A striking illustration of the reliability of high school as compared with university markings is to be found in an examination of the relative standing of superior and inferior pupils of the first year ranking. Tables IV and V represent

TABLE IV

DISTRIBUTION OF 1ST QUINTILE PUPILS

Year	High School 1	2	3	4	University 1	2	3	4
	%	%	%	%	%	%	%	%
1st q.	100	70	67	67	52	36	43	29
2d q.	100	21	17	17	20	25	26	32
3d q.	100	9	4	8	5	10	9	16
4th q.	100	0	8	0	5	14	18	4
5th q.	100	0	4	8	5	10	0	20

TABLE V

DISTRIBUTION OF 5TH QUINTILE PUPILS

Year	2	3	4	1	2	3	4
	%	%	%	%	%	%	%
1st q.	4	0	0	5	4.5	9	0
2d q.	4	8.5	8	10	9	13	29
3d q.	4	8.5	13	15	23	22	12.5
4th q.	25	25	29	19	23	17	21
5th q.	62.5	58	50	45	31.5	39	33

the distribution through successive years of first and fifth quintile pupils respectively. It will be seen that relatively few first quintile pupils fall below the third quintile except in the senior year when 25 per cent are in the fourth and fifth quintiles. A similar statement holds for fifth quintile pupils.

From the above illustrations whether based on general averages or on the averages for successive years it does not appear that the small high school with limited, often meagre, equipment, library facilities, and teaching force is worse fitted for preparing and selecting pupils for college than is the large and presumably the best high schools. The facts which have so far been presented are summed up in the following table of correlations. (Table VI.) It may be helpful to explain that an index of less than +.25 should be interpreted as indicating low correlation. From +.25 to +.50 means moderate corre-

TABLE VI

CORRELATIONS

General Average High School and University	+.53
General Average High School and Freshman University	+.48
General Average High School and Sophomore University	+.39
General Average High School and Junior University	+.47
General Average High School and Senior University	+.28
First and Second Years High School	+.77
Second and Third Years High School	+.76
Third and Fourth Years High School	+.75
Fourth Year High School and Freshman University	+.44
Second and Third Years University	+.71

Junior and Senior Years University	+.42
First and Third Years High School	+.67
First and Fourth Years High School	+.66
Freshman and Sophomore Years	+.73
Freshman and Junior Years	+.61
Freshman and Senior Years	+.45
English, High School and University	+.34
Mathematics, High School and University	+.29
History, High School and University	+.18
Ancient Languages, High School and University	+.43
Modern Languages, High School and University	+.28
Science, High School and University	+.34

lation, +.50 to +.75, high correlation, and +.75 to +1.00, exceptionally high correlation, 1.00 being perfect correlation. In addition to the facts already presented this table shows the correlation between specific subjects in the high school and in the university. The fact that the correlation between specific subjects is low has no direct bearing on the main question, but shows, on the other hand, a wide range of individual variation. A student may be good in all of his subjects but one in the high school which would give him a high standing. He may also be good in all his subjects but one in the university which would give him equally high standing there and would mean for this student high correlation. His poorest subject in the high school may, however, be his best in the university, and vice versa, which would mean a low correlation between two subjects for this student. Many similar variations are possible.

This leads to one further consideration which has some bearing on the main problem. It often happens that certain individual students who are marked consistently high in the high school receive low marks in the university, and vice versa. For example, the pupils who ranked 9, 104, and 119 are cases in point. The first pupil was marked uniformly high by his high school teachers. During the first three years in the university this pupil was ranked below average and just above average in the senior year. The other two were considered inferior students throughout their high school course, but in the university they ranked high or above average. The second pupil, number 104, takes his place at once in the first quintile where he maintains his standing with marked uniformity through the four years. The third pupil moves up more gradually. Starting almost at the very foot of the group and never rising above the fifth quintile in the high school, he takes his place as a university freshman among the medium members of his class. He maintains his standing throughout the course, moving up gradually to within 8 of the first quintile in the senior year.

Taking these pupils as representative of a class of students found in all colleges we may ask whether the school meets its obligation to this class. Two assumptions may be made with reference to each of these pupils. We may assume that the first pupil earned his high standing in the second and fourth years in the high school. If so, why did he not maintain an equally high standing throughout his course? On the other hand, he may have been only a low medium or inferior student, as indicated by his university standing. The opposite assumptions may be made with reference to the other pupils. If the first assumption is correct, and it doubtless is correct in many instances, then there exists somewhere in the school course a lack of adjustment between the curriculum and the individual. Somewhere in the course there was a failure to meet the first demand of public education, namely, to educate each individual up to his highest efficiency. If the second assumption is correct, the marking systems of high schools and colleges is a subject for further investigation.

The fact that three marking systems were made use of by the different schools included in this study would seem to indicate that the standing which pupils maintain in the high school and in the university does not depend so much upon the marking system in vogue in these schools as upon other considerations. More important than a system of marks is the right conception on the part of the individual teachers of the dignity of high school and college work. There should be a standard of value for each high school subject, which should bear a definite relation to college standards for the same subjects. These standards should be independent of percents or E's or A's or other symbols. They should rest upon a rational method of the distribution of ranks. Professor A. G. Smith[1] thinks that for the college this should be the normal curve. Whatever ideal method is employed must be determined by investigation and must be adopted by both the high school and the university. But when this is done there still remains the problem of standardizing the teacher's judgment.

[1] "A Rational College Marking System." Journal of Educational Psychology. September, 1911. Pp. 383-393.

THE OXFORD SYSTEM versus OUR OWN

By Wilson D. Wallis

In theories of education and educational systems no very great stress has, so far as the writer is aware, been placed upon the personal experiences of students who have been subjected to one or the other regime. Perhaps this is because one fresh from the system or systems has not acquired that proper perspective which comes only with time and further development and makes one's judgment of some value. The child entering its teens may not be able to estimate the value of its previous training so well as later, even though much of its experience be forgotten in the transition. The writer is fully aware of the limitations upon those who, for this reason, have only a meagre idea of what education in its largest sense should mean and possibly even less of how the desired goal is to be reached. At the same time, such experiences and view-points may not be without their value in the scheme of educational psychology and philosophy. If this be true, perhaps something of our own experience may be of use to those who have a better grasp on perplexing educational problems.

To a certain extent the writer is well qualified to offer his testimony, having taught a country school; then having gone to a small Eastern college of high standard where he graduated at the end of four years; followed by a three years' course at Oxford where he took one of the diplomas and a research degree, seeing, meanwhile, something of the University, *Gymnasia* and *Lycées* methods of Germany and France; holding for one year a Fellowship in one of the largest American universities; being, at the present time an instructor, having both graduate and undergraduate work in a large university. The writer has, moreover, during the past five years and especially during his three years at Oxford, been much interested in educational systems and ideals and has gotten the views and comparisons of some score or more of Americans, representing as many institutions, with whom he has been acquainted during the three years at Oxford.

Perhaps even the view-point of another university, the sympathetic understanding of an educational system quite

different from our own is not without its value. "The Princetonian should know how his *alma mater* appears when viewed from Cambridge, and the Harvard professor or overseer could sometimes correct a tendency to spiritual myopia by adopting suggestions coming from a source as distant from the Back Bay as is New Jersey." So far as most of the ready under-estimation of the value of educational systems and environment, differing from our own is concerned, the writer is convinced that, in large part, "Ignorance is at the root." It is with education as with science and culture—if a distinction can be made—"When a man talks slightingly of the position and work of his profession in any country, or when a teacher tells you that he fails to find inspiration in the work of his foreign colleagues, in the words of the Arabian proverb—he is a fool, shun him! Full knowledge, which alone disperses the mists of ignorance, can only be obtained by travel or by a thorough acquaintance with the literature of different countries. Personal, first-hand intercourse with men of different lands when the mind is young and plastic is the best vaccination against the disease of Chauvinism. The man who has sat at the feet of Virchow, or has listened to Traube, or Helmholtz, or Cohnheim, can never look with unfriendly eyes at German medicine or German methods. Who ever met with an English or American pupil of Louis or of Charcot, who did not love French medicine, if not for its own sake, at least for the reverence he bore his great master? Let our young men, particularly those who aspire to teaching positions, go abroad. They can find at home laboratories and hospitals as well equipped as any in the world, but they may find abroad more than they knew they sought—widened sympathies, heightened ideas and something perhaps of a *Welt-cultur* which will remain through life as the best protection against the vice of nationalism." We need to be reminded that we are "everywhere tinctured with national characteristics" and that self-satisfaction is the antithesis of progress.

* * * * * * * * * *

My first term's work at Oxford had much the nature of a prolonged disappointment. I felt myself distinctly and uncomfortably out of harmony with things. I did not know what to do or what was expected of me. Little wonder! In my college life I had had prescribed portions of definite books to learn within a certain time, be examined on those portions and have done with them. Whatever else happened

I could feel that I had accomplished something and could pretty definitely say just what I had done. Not so at Oxford! Lectures were recommended to me but no roll was kept. I had no text-books! If I asked what to read a list of some half-dozen or more books was given me, from which usually I might make my own choice.

The tutor—*voila* the Oxford system! This tutor I met each week, being alone with him an hour. In the meantime I had been assigned a topic on which to read and had to prepare a paper on it to hand in to him the night before he met me, or, sometimes, to read him when we met. Sometimes he gave me a definite book or chapter to read, sometimes portions of several; he might give merely the titles of the works or leave their discovery wholly to myself. What he tried to obtain from me was a paper in good style dealing with my topic in an original manner in which I might make use of but not copy the ideas of the men I had read—their grist must go through the mill of my own personality. The purpose was, above all, to arouse a critical attitude upon the part of the student who would be given little or no credit for the parrot-like recital of what someone else had written. Not to amass but to elucidate and interpret were the ideals at which he aimed. "It is characteristic of the Oxford Final Schools," writes Sir William Ramsey, "that their system of training, as I knew it of old, tended to produce that fine sense of balance which enabled a man to see the principle in the detail, and reconstruct the detail from the principle, and to remain clearly conscious all the time of the distinction between the principle and the detail."

To me, nothing seems to have been so worth while as the inculcation of the critical, think-for-yourself attitude. In every way possible it was invited. To disagree with your tutor, to take exception or to suggest another view-point was to please him mightily. He wanted you to talk so as to find out where you stood, what you were thinking about, and just there he would meet you. In a word, he wanted to develop what was in you, and not to hand out to you ready-made material. "To be stuffed to repletion like the Strassburg goose," is not to develop within yourself that dynamic mental fibre which alone is education. This is practical, every-day recognition that "we learn only by our own efforts, and not by watching the efforts of others. Some one has said that the college is a 'gymnasium where the faculties of men are exercised and developed, rather than a boarding-house where the students are crammed with facts.' We develop physical muscle by *exercise*. Is there any other way of developing

mental fibre? Can we ever cause mental fibre *to develop* by dealing out ready-made ideas? It is a psychologically impossible process." And yet, how many of our teachers are mere waiters at the intellectual boarding-house table, rather than instructors in the intellectual exercise which gives both command and development?

This give-and-take between tutor and student leads to a lucidity of exposition which no formal lecturing can make possible. You are never so close to a man who talks to several of whom you are one, as when the same man converses with you alone. Relations soon lose their strained nature and you and he are friends. No friend will impose himself or his views on you; but if he be of bigger caliber he will gradually lead you out into broader pastures, he will open up vistas, he will entice you from your narrowness and you will get something of the spirit of the man himself who is your friend. At the end of my two years' acquaintance, one of my tutors said to me, as I was leaving: "Well, I feel we have been good friends, don't you? And after all that is the most important thing." I did not know then how much that meant. I know now that it means a life-long influence which will be for me more than all else in my university experience—a perpetual influence of a great mind and a great heart; of a man into whose methods of work and aims and broader sympathies, I gained clearer insight than even he has guessed. Given this, and all other things might with diligence and time be added; but given all others without this and the alchemy which transmutes the baser, useless facts of knowledge, into principles and interpretations of value above price, is lost to us. For after all, as one of the most knowing as well as one of the wisest teachers has said, "the value of experience is not in knowing many things but in being able to judge wisely." "Make your evidence talk!" was my tutors' admonition; and one of the most valuable lessons I have learned is that to make one's evidence talk well and wisely is the most treasured secret of all one's life-work.

How far from instilling this critical, interpretative attitude many of our teachers are! I remember particularly a day when I had finished reading to my tutor a paper with which I was fairly well satisfied, and was waiting for comment. It came in his jovial way: "The trouble with you is that a wink is as good as a nod. If I could only get it into your head that B—— and I are the biggest fools in this university, that everything we have told you is wrong and you would start out to prove our ideas to be of no account, I believe

there might be some hope for you!" Almost any Oxford tutor could tell a student that. I have wondered how many American teachers could say it! How many care to have opposing theses maintained by students? An Oxford don would boast of it to his dying day. To have developed a scholarly genius and industry that, at least in some quarters outshone his, would be the greatest pride and one to which he would, if not over-modest, give voice. It were well if there were more to remind us as does Sir Leslie Stephen, that, "Whatever tends to break up the intellectual stupor of large classes, to rouse their minds, to increase their knowledge of the genuine work that is being done . . . must have our sympathy, and will be useful both to those who confer and to those who receive instruction." Here, too, is where "those who confer" should most profit. My tutor assured me—what, of course, I do not believe—that he learned more from his students than they learned from him. With different reading and different view-points and each with his own interpretations, a tutor doubtless is helped immensely by his several students. Is it not unfortunate that we teachers miss that?

First and foremost in the tutorial system must be reckoned the personal contact with a man of higher caliber. This is everything. Let me quote from two men who have expressed its value incomparably better than any words of mine can do. And let us take their words to heart. The first is from John Henry Newman, the second from Principal W. M. Childs in an article entitled, "*The Essentials of a University Education.*"

"I say then that the personal influence of the teacher is able in some sort to dispense with an academical system, but that system cannot in any way dispense with personal influence. With influence there is life, without it there is none; if influence is deprived of its due position, it will not by those means be got rid of, it will only break out irregularly, dangerously. An academical system without the personal influence of teachers upon pupils, is an Arctic winter; it will create an ice-bound, petrified, cast-iron university, and nothing else."

"University education should afford the student the shock of a new experience; it fails if it amounts to no more than a prolongation of school, or a new wrestle with text-books and examinations in order to achieve a commonplace triumph. But if we ask in what the new experience consists, we can only answer that it consists in coming into personal relations with teachers who approach their subject, and communicate a knowledge of it to others, with freedom and mastery, who

not only teach others but investigate for themselves, whose authority is at first hand. It is under these conditions, and perhaps under these conditions alone, that oral teaching claims a rightful superiority over every other kind. Carlyle, in a perverse moment, declared that the true university was a collection of books. Books are very well if it is a question of gaining intellectual entertainment, or aesthetic pleasure, or useful information, or if it is a question of preferring the winged words of a master to the stumbling utterances of a hack. But if the question is the gaining of mastery over a difficult branch of knowledge, the living voice of a great teacher is indispensable. To hear and see him at his work is to gain an insight into method and aim which can be gained in no other way, to learn the true proportions and relationship of parts and the central point of view, and to exercise the stimulus of personality."

Another very distinct advantage which the Oxford system has over our own is the grouping of the students' work about one subject, the application to this of three or four years' continuous effort, and the holding him responsible at the end of this period for the whole of his subject. The college gives, usually, a short examination at the end of each of the three terms in order to see whether or not a student has done serious work during the term. None of these examinations, however, count toward his degree which is determined wholly by the 'final,' a university and not a college function. Examinations are essentially unfair and are to some extent, as Sir William Osler says, a stumbling-block in the way of the true student. As examinations go, however, these seem to be eminently fair. They extend through a period of six days, of six hours per day. In this time a student will have written sufficient for the examiners to determine whether he is worthy of a degree. You may depend upon it that a few weeks cramming will never fit you for the ordeal, and, yet, while you cannot fool the examiners all the time for six days, it is also true that you will not fail to prove your good points by reason of misfortune in the list of questions. While most difficult, such an examination seems, from the point of view of all concerned, most fair and satisfying.

Such a scheme of examining has, we believe, superior advantages over our 'choppy' examinations that deal with knowledge as so much disconnected material that can be measured, sawn off, and thrown aside. The most honest student cannot do his work in quite the same way if he knows it will profit him, academically, only until

the following spring or, it may be, only until the end of term, as if he knew each day: This is of no use if learned merely for a day or a year; I must somehow incorporate it in the whole of my knowledge of this subject so that it will help me in the solution of the larger questions and topics with which I shall have to deal, in that six days' examination. This from the narrower point of view of the man whose driving stimulus is the examination. From the broader point of view of mastery of the subject the Oxford system has the more noble end of interesting a man in a subject for its own sake and gives him incentive to continue working and to develop both intensively and broadly.

It has also this great advantage not possessed by our examination system: It gives a man an opportunity to show to the full the extent and value of his outside collateral reading—in a word, it puts a premium upon individual work of a high order. In the arrangement of our curriculum and examination, there is almost no way in which a man can profit from his independent reading whereas the myopic 'grind' whose eye is single to the text-book used and the lectures delivered easily carries off the prize. The present system may it—that is, upon those who are becoming most competent in their line of work. But we can feel no assurance that this will be the case and the test puts at a great discount the independent, thoughtful efforts of the student who is thinking for himself and laying broadly the foundations of a future career. No wonder then that in Oxford the Phi Beta Kappa men are held in no high esteem by the committees who pass upon their educational qualifications.

The requirements of the examination are happily arranged to test the scholarly attainment of the students rather than to see how well they have learned the schoolmasters' allotted task. The paper consists of about nine questions of which "the candidate is recommended to answer not less than four and not more than six," in the three hours. Add to this choice of half the questions—for the best students usually limit themselves to four questions, and may spend most of their time upon three—the stating of a topic or of a problem rather than 'catch' questions, and the scholar is again at an advantage, the dilletante at a disadvantage. Who will not say that one's ability to deal with the larger phases of his subject in an intelligent, original way is not a far better guide to his scholarly advancement than any list of 'catch' questions or details will supply? 'Not that the man rich in details does not have his opportunity. Exceptional work and ability of any high grade will meet with its due reward. Hence, to be

ranked high in an Oxford Honour Course is indeed of some value—often to determining a man's life career.

The ranking of the men into classes, first, second, third and fourth, has its advantages in that an absolute and not a relative standard determines this listing. Moreover, the insistence upon a good and finished style in the case of all those who are given high rank is a direct incentive to read good literature for its own sake and to learn to write well. After all, the ability to express oneself in a lucid and pleasing style is not the least valuable endowment of a finished scholar.

Reference has been made to the grouping of the work. A man takes his B. A. in German, or French, or Physics, or—what you will. He does not take German and French, or Physics and Chemistry. When he starts his three years' course in German or French he is supposed to know enough of the language to take lectures delivered in that tongue. This is specialization. At first sight it may seem premature and deplorable specialization. As handled at Oxford, however, it seems to be at once as liberal and broadening as it is delimiting. The course in French, for example, involves a great deal of phonetics, even to the physiology of utterance; there is philology, comparative and historical; the French philosophers call for an understanding of their philosophic doctrines—Descartes, Pascal, Montaigne, Voltaire—involving something of the history of philosophy and even of contemporary philosophic interpretations; there is French history, science, contemporary life. No one could call the course narrow. It touches nearly every side of culture and in touching it accomplishes what our varied activities pre-eminently fail to do, viz., focuses attention on a given field where every advance is a direct step in conquest of the whole. It does more than this: it gives the student an intimate acquaintance with the source-materials; it teaches him how to work and think and how to value appreciatively and critically both his own efforts and the efforts of others; it teaches him to distinguish scholarship from charlatanism, the genuine from the spurious; it gives him scope and incentive for individual effort and research. Only under such circumstances, be they his natural environment or of his own unaided creation, can a man do his best work—the work which is the open sesame to future contributions of worth.

The result of this system as compared to ours seems to me to be that the Oxford graduate comes out prepared for something in particular and the American graduate superficially and uselessly prepared for anything you like and sufficiently prepared for nothing in particular.

Of the ultimate uselessness of the great variety of topics

in which we now deftly dabble some of our educators are becoming convinced. From two of the most eminent there comes promising assurance of the need for a change. In *Educational Problems,* Dr. G. Stanley Hall writes: "Most boys, and even more girls, who begin German and especially French, never command it sufficiently for much use in either speech or writing. If it lapses into disuse there is educational waste as there is where any study aborts. A few terms of languid application, a few score pages read, a few authors dabbled in with the aid of the teacher and the incentive of marks, social stimulus of fellow members of the class, competition and then oblivion involves not merely the loss of effort that to-day might be far more profitably spent among many topics in the culture demanded of modern life; . . . it means mental tissue left to disintegrate."

To the same effect are the words of President Lowell in his Inaugural Address delivered at Harvard in which he recognises the approximately successful solution of this problem by Oxford and Cambridge. He says also:

"The college ought to produce, not defective specialists but men intelligently well rounded, of wide sympathies and unfettered judgment. At the same time they ought to be trained to hard and accurate thought, and this will not come merely by surveying the elementary principles of many subjects. It requires a mastery of something, acquired by continuous application. Every student ought to know in some subject what the ultimate sources of opinion are, and how they are handled by those who profess it. Only in this way is he likely to gain the solidity of thought that begets sound thinking. In short, he ought, so far as in him lies, to be both broad and profound."

There is still another advantage in the Oxford system of examination which tends to keep both teacher and student out of the ruts of mere routine and up to a standard which otherwise would be lacking. The tutorial work is wholly collegiate, that is, is provided for by the college of which the university man is a member, whereas the examinations that count toward the degree are independent of any of the colleges, being wholly under university supervision. The college must train the student up to the university standard. The scholastic standing of colleges differs and a great deal of pride is taken by the college in the record of its students who have entered the Honour Schools. Not only does this keep the college and every department of the college up to a certain standard; it adds directly a stimulus to the efforts

of every individual tutor. It is evident that the efficient or inefficient work of a given tutor will not be manifest in the attainment of his students taken individually, nor, indeed, in the record of any one year. But it is equally clear that the respective values of a good enthusiastic tutor over a careless uninterested one will show themselves clearly in the course of a very few years. Thus the university keeps each of the twenty-two colleges up to a set standard and the college in turn can keep tab, to some extent, on the quality of work done by both tutor and student. Perhaps we of the teaching staff need an occasional prodding as much as ever a student needs it. Under such an arrangement, the teacher who has ceased to be also a student may soon learn that he has missed his calling; under our system there seems to be no means of properly estimating the teacher's efficiency, in that he gives the course and the examinations, marks for them and may get along equally well whatever his merits or demerits.

Reference may be made, if only in a most inadequate manner, to the place assigned out-of-door sports in the educational curriculum. I have heard that a private gymnasium is to be found in some obscure corner of Oxford's winding lanes; but in my three years' residence I failed to find it. I never knew any one save some boxers and fencers to use the gymnasium (the swimming pool being in another building). From one o'clock until five, there are no lectures and no tutorial hours. Every day of the academic year nine-tenths of the students are out in games or sports of some kind: rowing, tennis, Rugby or Association foot-ball, cricket, etc. No one is watching the game—practically everyone is a participant in some of them. To train up a team of men to play and a student body to look on and shout at the proper —and improper—time, seems to the Oxford man as sensible as training a few finished scholars for the recitation and the remainder for onlookers and applauders. I cannot dwell here on the spirit of fairness, of the liberal applause invariably given the good efforts of the opposing team, of an enjoyment of the game on its own merits rather than simply as a means of winning more points than an opponent succeeds in getting—in a word of sport for sport's sake. The following quotation from G. Stanley Hall's *Educational Problems* is, as the writer can testify, typical of the fairness of the English player as you find him in the School and University:

"Two years ago the English tennis champion was nearing the end of the third rubber game. Both were exactly even

when the American made a fluke which would have lost him the international championship, but the Englishman deliberately made exactly the same fluke because he did not count it honorable to win on an accident. This was true sportsmanship the very heart and soul of our country's need. Collegians need it on the diamond, gridiron, and track; how we now need it in business, trade, politics! If that were the spirit, instead of winning at any price, I wonder if we might not almost sanction racing, pugilism, and even duelling if they only were schools of honor, pure and undefiled, instead of dishonor."

In the words of a recent writer, the participant "finds himself partner in a game conspicuous from all time for its perfect straightforwardness. There is absolutely nothing crooked in its methods and aims. So much was the honour of the thing enshrined in the bosoms of players, that a proverb coined in days gone by has been handed down for generations as part of the moral code to condemn any unworthy act in the phrase, 'It isn't cricket, it isn't playing the game.' That proverb runs throughout the British Empire wherever its sons are gathered, whether the game continues to serve them as a pleasure to be shared in or not." [1]

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In a word, the eminent advantage possessed by the Oxford educational system over the prevailing educational curricula of this country seems to be in the practical recognition by

[1] "The English public schools since the time of Arnold have recognized the importance of sports in developing the many qualities which make for sound character. One need only visit the playing fields of Rugby on an afternoon of a half holiday and watch the boys at play, or walk through the cricket clubhouse where no lockers are necessary to insure the security of one's possessions, to realize that there are standards of honesty and sportmanship attainable among boys which we have as yet hardly dared to hope for. It is true that the boys in these schools come from a distinct class and present a homogenity of ideal and training which is found in none of our public high schools and is only approached in a few of our private schools; yet the traditions and practices of the great public schools of England are the result of an appreciation of the possibilities of utilizing the natural social instincts of the boys and of a definite plan of organization for the purpose of securing through these the best possible training for the leaders of the next generation. Of late, notable success has been secured in the same direction in the English municipal day schools, which are very much like our public high schools. The most valuable lesson which we learn from the English schools is their recognition of the value of the more purely social activities as a means of training the youth and in their method of organizing these activities in such a way as to secure the best results."

the former of the great principle of academic education which has been thus expressed by one of our great international teachers: "To start a man on the right path is all that we can do. We expect too much of the student and we try to teach him too much. Give him good methods and a proper point of view, and all other things will be added, as his experience grows."

THE STHENIC INDEX IN EDUCATION

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For our present purpose, somewhat arbitrarily, we may analyze the ideal education of children into three phases, more or less commingled: neuromuscular training proper; the accumulation of data; and the development of skill, cleverness, or aptness whether of the body predominantly or of the "mind." The opinion of competent authorities that the first three years of the usual school-life were best devoted largely to outdoor evolution of the central neuromuscular mechanism certainly is gaining more and more momentum. That the years from five to eight are not so devoted at present seems to be the fault of circumstance rather than of pedagogic demand. Meanwhile, until we get thus far, the physical education of school-children is making masterful strides toward the goal. As for the second educational phase, the acquirement of facts, of concepts of quality and relation, for assimilation into "knowledge," this assuredly may be left to take care of itself, for the past has shown that it is competent to do this and in fact to overdo it. As will be seen, it is one of our present premises that this purely intellectual side of education is ordinarily exaggerated at the expense of the affective side. The development of cleverness and skill, whether in many directions or in only one, whether with the "mind" or primarily as a cunning of the hand and eye, represents, perhaps, the realest education, the vital "leading-out" process of the personality learning how to live.

It is with this third kind or phase of human education that our present discussion deals, with its conditioning relations especially. But we shall use the terms skill and aptness in no narrow technical sense applicable mostly to manual or at most to muscular dexterity, but rather in the broader way indicated almost by "cleverness,"—general adroitness of the psycho-physical mechanism. The more immediate purpose is to call needed attention to certain of the conditions of this, the highest, aspect of education, highest in the sense that it is the most personal, most representative of the individual initiative and effort and happiness. We shall see how intimate is the association in the total mechanism of efficiency between the feelings, bed-rock of personality, and the inhibi-

tory functions and powers that characterize man as a limitless and no longer brutal animal. This phase of education best represents the mind as a whole, for whereas the accumulation of ideas and their association is mostly cognition, and physical education predominantly volition, skill and cleverness are inherently dependent on both of these aspects of mind and moreover are conditioned far more than most teachers realize by the affective phases of life, dominantly pleasantness and unpleasantness. A child can learn the chief battles of the Revolutionary War or even the rule for finding the cube-root whether he enjoys it or not, he can go through a Swedish gymnasium-drill with a minimum of attention and interest, but we are beginning to see that in order to gain in faculty nearest to cleverness and originality, to become clever, skillful, and adept, expert, dexterous, he must "put his soul into his work,"—and the ground of his soul is not thought but feeling and will as well. One is reminded of the somewhat trite dictum of Pestalozzi: *Keine Kenntnisse ohne Fertigkeiten,* a word surely not less prophetic of the years to come than once of the decades now gone by. It is our immediate endeavor, then, to try to define some of the relations between this highest phase of education and the more purely organic phases of the learner's feelings and will, mechanism of his highest efficiency.

Let not the teacher, eager for technical data on which to develop his art, expect or hope for too much from any such discussion. The scientific world is young as yet and the organic relations are more intricate than any but a few specialists (in physiology and hexicology) even appreciate or much less understand. Witness the always wise and broad-minded Henry Maudsley (31): "Moreover because in its (the human organism's) nature all things have silent intelligence one with another and each with the whole, therefore the greater in number, the wider in range, and the more special in character the relations between it and its surroundings, the fuller and keener will its life be. In this process of interrelation it is acted on and reacts, suffering passions and performing actions, combining impressions in perception and reflection, and responding to them through fit volitions; such actions and reactions being the physical basis of its various sensations, feelings, thoughts and wills." "The senses, which are so many specializations of one sense, and at the best most relative and finite, do but break up the unity of nature, fashioning it fragmentarily in the individual according to the forms and measures of his feeble apprehensions; and the utmost that he can know of himself is no more com-

plete measure of the infinitely minute operations of his body than it is of the infinitely vast operations of the universe."

All of my readers who are familiar with the large literature on attention or with the precise conditions of attention itself; with the extensive taking of tests of efficiency of any kind; with research-work on the development of skill; with gymnasium management; with the administration of any large highly technical establishment of whatsoever other sort, etc., etc., realize how very much in the course of a month the euphoria-malaise balance means in the efficiency of the adult individual as an agent. (These unfamiliar terms euphoria and malaise seem to have no practicable substitutes. "Algedonic" has a different meaning.) Despite the greater smoothness of his health-curve, the child in school is far more influenced by stimuli than is the adult, and moreover varies more in respect to his active efficiency in ways beyond his control. The child, of course, is never a passive reservoir for data, but learns only by a certain degree of activity, and in every phase of his education suffers from organic delinquency in proportion to this activity,—in the physical phase of education least, in the acquisitive phase more, and most in the psychophysical stage, in which immediate technical efficiency of mind or body is the immediate aim. We seek, then, in this essay to co-ordinate some of the main conditions that determine mood, humor, temper, or whatever else it might be named, in its relations to education. The complexities of the research are as obvious as its importance. Many years ago the present writer intended to set out upon an elaborate investigation of temperament and mood, but after some weeks spent delving in the literature, abandoned the subject (as doubtless many have done before and since) as far beyond present-day physiologic explanation. This is probably a common experience with research-men, but they learn after a time to simplify and then to further analyze and simplify and so finally arrive at conditions that really are amenable to more or less exact description if not to measurement. So it has been here, in fact. Out of the present chaos of the psychophysiology of emotional moods, a chaos of chemic, physical, physiologic, psychologic, anatomic relations, emerges one factor that seems to be not only in part describable but fundamentally important. Perhaps, indeed, if our ideas be true, this is the principal element of the syndrome which is considered to be an active determinant of the learner's stream of consciousness. We gain knowledge continually, though bit by bit, concerning the bodily conditions of emotional and other energies common to mind and body.

That which we have ventured to speak of as the sthenic index is just like other indexes so frequently used, for example in physics,—in general, indicators of tendencies or conditions, positive or negative. In the present usage the index indicates the relative amount and direction of the energy or strength inherent in any complex of feelings and of study-processes, for example. Out of all the attempts at a classification of the feelings and emotions, that one which every phase of modern physiology tends to support is the familiar supposition, biological in nature, that makes most useful emotions sthenic and pleasant and with extensor "expressions," and most harmful emotions asthenic and unpleasant (or by dint of their extreme activity, neutral) and with tendencies to flexor "expressions," as indeed has been already set forth by several writers, for example, in an investigation of joy (10). We can therefore properly talk of the sthenic index of any psychophysiologic process, such as a school-child's study-hour, for example, provided it has discoverable emotional tone. pleasant or unpleasant. There is no one term, however, that expresses just this personal attitude; perhaps one usage of "humor" comes closest to it (good humor and bad humor), but exactness requires circumlocutions for the state of mind" such as "I don't feel good to-day," "Don't feel like work just now," "This is an off day with me," or, on the other side, but far less often expressed (such is human nature!), "I feel good to-day," "Working is a pleasure this morning," etc., etc. Among the children, the day has not come yet when one hears expressed in words such indications of fundamental condition, partly because of fear of the teacher, the importance of these things being as yet too generally unrecognized, even in the advanced schools and especially in training for the development of whatever kind of skill. No one would venture the opinion, however, that these moods, characterized by unpleasantness and pleasantness respectively and, according to affective doctrine, therefore, by asthenia and sthenia respectively, are not both of great frequency and of great influence on the process of education. The whole attitude of creators, of persons who create great pictures or poems or theories or symphonies is against the method of unvarying grind, time-serving monotonously every day. This method is suitable for acquisition in school and for hack-work as a vocation, but it is physiologically wrong in ratio to the originality of the work. It is unfit, for example, in the development of aptness for any particular line of originality, whether it be the solving of problems in algebra or geometry, in fixing associations for remembering foreign words, or the skill that

teaches one's organism the masterful handling of a graver or the hammer of the silversmith. "As all men have some access to primary truth, so all have some art or power of communication in their head, but only in the artist does it descend into the hand. There is an inequality, whose laws we do not yet know, between two men and between two moments of the same man, in respect of this faculty. In common hours we have the same facts as in the uncommon or inspired, but they do not sit for their portraits; they are not detached but lie in a web. The thought of genius is spontaneous; but the power of picture or expression, in the most enriched and flowing nature, implies a mixture of will, a certain control over the spontaneous states, without which no production is possible." (Emerson.) One only need peruse any composition extending over a number of days (this present essay, for example) to see how conspicuous this daily difference is. As I look over the manuscript for revision I find in some days' work many more errors than in others.

To make concrete this principle that truly creative talent develops for the most part only when the total resultant of body-strains is right, one could cite universal experience in every individual, laboratory measurements, etc. One of the latest and most conclusive of these announcements is the research-report of W. F. Book (4) on his work on the development of skill in the use of a typewriting machine: "It is not what the learner would like to do, but what his mental and physical condition at the time of study or practice will let him do, that is important for determining his progress." "The most economic learning would seem to demand that the learner work only when he can enjoy it and succeed—and to wait until he can." The average psychologist, trainer, artist, craftsman and writer knows this already and acts by it, but this statement is explicit indeed and grounded in extensive, exact research already famous. The present writer on the basis of observation and of research-work not yet reported, has no doubt whatever either of its truth or of its great educational importance. It is a concrete inductive utterance of a principle of almost universal application if we would do our teaching as well as possible and our own work both economically and well.

Our immediate purpose, then, once more, is to set forth a summary of the most essential of the bodily conditions of these balances of emotional tone, and in particular to show why and how this balance when euphoric is sthenic and when unpleasant, asthenic.

One familiar with the complex phenomena of hysteria is

apt to be struck with the similarity of these moods to that widespread and still ill-understood "functional" disease. Few men know more about the latter than Morton Prince and to him it seems plainly a dissociation of consciousness, the normal and the abnormal persisting in the personality "co-consciously" in whatever way this "co-consciousness" be understood. These particular moods or "off" conditions give the onlooker the same strange feeling that hysteria gives him, namely, that effort of will would abolish the condition even when most unpleasant and when most abulic. Such an impression, however, simply means that we do not as yet understand or appreciate the subtlety of the human will. Both conditions, malaise and euphoria, are dependent most assuredly on endogenous defects beyond the reach of the everyday will, even indirectly. In some respects a mood of the kind we are discussing, an "off day," is a temporary but more strictly functional, hysteria. If both be dissociations properly speaking, possibly they alike are dissociations based in bodily conditions—and what physiologist is there who does not realize how easily an agent of metabolism, a hormone for example, may be "dissociated" from the remainder of the body! Vegetative or smooth muscle is nearly everywhere in our bodies and is liable to be erratically set in contraction anywhere by influences coming from the intricate sympathetic.

When a person has a feeling of satisfaction or of delight in his work, then, he does it well, when of ennui and repugnance, he does it ill and makes no advance. When creative work is pleasant to the worker there is progress, when unpleasant, regress. What are the bodily conditions? To what extent can present physiology explain this far-reaching condition of the development of efficiency?

If we accept the ordinary notions of consciousness (a committee of the American Philosophical Society last December printed twelve of them all different) we are forced to admit that the experience of pleasantness as pure experience is not the underlying cause of the success of the study or practice under conditions of euphoria, nor the unpleasantness of the failure in malaise. So far we have come upon nothing in our discussion that suggests anything of a *dynamic* nature in these opposed states of mind—nothing, in short, to explain the presence of a sthenic index at all rather than an undynamic index or balance of euphoria or malaise. We seek then to know, if we can, why pleasantness should make the expense of energy more effective in learning, and unpleasantness less effective.

In the most general way the sthenic index for education is

identical with that in "physical" education, taught in the physiology of exercise. Euphoria represents a high plane of metabolic efficiency, the intake of energy and its outgo being large,—the plane, for example, of the lumberman in the winter forests of Newfoundland. Malaise on the other hand is a low plane of efficiency, that for example of a sufferer from typhoid lying some weeks in bed, the intake of energy and its outgo then both being low. So far as metabolism is concerned both of these planes may be normal, although one is far higher than the average, the other far lower. Trouble comes only when the intake-outgo balance is either way disturbed. On the high plane of efficiency success attends even the greatest efforts, but on the low plane is, to say at least, unusual. And here we come upon the difference between the metabolic planes proper and the euphoria-malaise planes. Both have sthenic indexes of their own, but, one case involves the energy of the whole body and especially of the body's fifty per cent of muscle, while the other concerns probably for the most part only the readily fluctuating sthenic index of the nerve "centers." One factor of this latter dynamic balance not possible in the other is dynamogeny: the emotional multiplication of energy-expense. The typhoid patient could not by any possibility in general do the long, hard, wet, cold day's work of the lumberman in the northern winter's woods—before noon he would be dead. On the other hand, the boy striving to advance in his school-work but blocked for a day by his "malaise," is perfectly able to "get mad" at himself in its midst and to change an "off" hour or day into one of splendid energy, enjoyment, and success. This seldom happens to be sure because the incentive and will are seldom present in school days, just as the abulic neurasthenic or hysteric seldom bursts the invisible bonds that hold her; indeed when she does so it is most always at the hypnotic stimulation of emotional or conceptual energy or under stress of a powerful emotional dynamogeny such, for example, as the occurrence of a fire in the house.

This balance of enjoyment in suitable hard work, whether it come from the "delight of life" obvious to all, or by this "paradox which comforts while it mocks," from a task just now distasteful and discouraging almost beyond perseverance yet turned to a delight, has its primary ground certainly in good health viewed especially as normal metabolism with normal assimilation as one side of the triangle and normal dissimilation as the other—good nutrition balancing good excretion, in short, vigorous sympathetic innervation.

More in detail, this sthenic balance probably depends especi-

ally on two factors, each in itself broad and complex and ramifying into every aspect of the organism. The first of these is properly nourished and well rested "nerves," and the second normal internal secretion. These two factors are in reality of course inseparable parts of a physiologic syndrome the details of which many workers at present are striving to describe. When at length we know something of these details and of others less manifest, but probably related to them, we shall be able better to control the conditions of the highest learning efficiency.

The *proper nourishment of the nerves* involves as inherent part of itself, the needful amount of rest. Unless there be two sets of neuronal knots ("centers") for the coördination of some of the vegetative movements, it is in fact not easily seen how the nerve-cells continue to do their work under the worst of the conditions in city-life. We may, none the less properly, consider these two in a brief way, separately.

Many things of late have combined to suggest that the proper nutrition of the nerve-cells of the central neural axis depends especially on the phosphatids. These are complicated substances (lecithin for example) belonging to the class of lipoids and consist of carbon, hydrogen, oxygen, nitrogen, and phosphorus. As their name implies, these are fat-like compounds, but they are much more complex even than fats. They are phosphorized and nitrogenized fats, and are therefore highly unstable substances with abundant calory-value for their own essential purposes. Perhaps herein lies solution of the ancient secret of the prevailing good humor of moderately fat people as distinguished from those whose bodies contain little fat; it is readily believable that civilization's debt to the nerve-cells often is unpaid. One sees it in the neural devastation of worry—a chronic passion of fear, the most asthenic and the most unpleasant of all the emotional processes. How closely allied worry is to discouragement, if it need further discussion at all, will be considered later. Worry uses up nerve-energy at the maximum rate and rapidly consumes the general body-fat whether it does the lipoids and the chromatin of the brain-cells or not. The recent research of Crile (8) on the neurochemistry of fear is conclusive enough as to the energetics of the chromatin-masses or Nissl-bodies: "The cells of the brains [of the rabbits] that were secured in the midst of fright showed marked hyperchromatism [see Dolley's explanation of this (16)]; those that were taken several hours later showed marked chromatolysis, a disturbance of the nucleus-plasma relation and some broken-down cells. The spinal cord showed but slight changes, the

medulla more, and the cerebellar and cerebal cortex most." Marinesco's name for the chromatin, kinetoplasm, well enough indicates his idea of the status of the substance, while the experimental studies of Hodge, Mann, Dolley, Warrington, etc., have put it beyond dispute that this iron-containing nucleo-protein furnishes part of the strength in some still unknown way, of nervous action. The skill research of Book already mentioned may possibly suggest another step in this direction, namely the hastening of the blood-stream through the exceedingly vascular brain as shown by the close concomitance found by him between the effective effort and the pulse-rate.

The recent most important experiments made on a large scale in certain public schools of our Metropolis, in which many indigent children were fed at noon-time and in the morning on proper nutrients, the children showing within a short period a marked improvement in scholarship, indicate in a simple and striking way the ground of this matter of cerebral nutrition. Physiologists will be interested to learn sometime whether the chief factor in the dietetic change were quantitative or qualitative. In any event, this epoch-making research, simple as most of the greatest are, shows to the world of men and women, to the millionaire-world in particular, that this saddest of all sights on God's earth, a weak, hungry, shivering, peaked, ill-nourished, unhappy child, is not only something sad, but (which will appeal to all to whom the other might not appeal) also something inherently extravagant, uneconomic, wasteful in the State, for these children are liable to expensive disease, and liable below all to inefficiency to earn, thus wasting the considerable funds expended for their proper education. Here in this experiment, in a fortnight or less, in these slum-children the euphoria-malaise balance changed from misery to a low-grade happiness and with it went the sthenic index from failure to success—who can doubt it? If the organizations familiar with method cannot point out the economic solution of whatever difficulties lie in the administration of this public feeding of the underfed, so much the more need is there that they should develop a method. Nothing that they could do in the way of organized charity is more important. We know now that the calory-amount of food required varies more or less directly with the amount of muscular work performed, with the air's temperature and moisture, with the worker's bodily shape, etc.; and we know just as well that so-called mental work cannot be at its best, especially in its higher phases of efficiency, the development of skillful efficiency, mental or

"bodily," with less than enough food to keep the individual content and with ample endogenous nutriment flowing through his arteries. And this food, we know, should be taken not on the boa-constrictor plan of large meals seldom, but in such a way as to maintain at normal constant level the kinetoplasm of the nerve-cells.

Surely, however, the neural tissue is not the only one concerned with the euphoria which conditions the highest learning efficiency. *Nulla mens sine musculo* is almost the modern version of Pestalozzi's dictum quoted above:—there is no truly efficient mental action without the activity, kinetic or potential, of muscle-tissue (13). The metabolic relations of muscle to emotional processes is a very new phase of the matter, however, so that but few exact data are as yet at hand. Cannon (7) and Hoskins (21) have made a beginning in this phase of psychophysiology.

The rest or recuperation required by the nerve-centers if they are to represent an euphoric sthenic balance in consciousness and for successful education, has never received in a systematic and official way a tithe of the attention its importance demands from educators. A recent editorial in the *Medical Record* (27 Jan., 1912) suggested more at length than is necessary here some of the practical conditions involved in adults in undersleeping. In school children the case is quite as bad in as much as the effects are more prompt, probably more lasting, and certainly more serious on the spinal and the cerebral "grey." Every treatise on neurasthenia, every discussion of fatigue, etc., etc. emphasizes of course the need of abundant sleep, but less at length and less vigorously it is certain than they would do did not every reader know from numerous experiences the acute inefficiency for all of the highest grade of work following a sleepless night or even one much disturbed. My own work on the development of skill with many subjects has shown this to be probably the dominant factor in "off days," one more important than normal menstruation, for example, or atmospheric conditions or even undue monotony in the work. The organism certainly has the power of overcoming at any hour this asthenic balance under normal conditions of nutrition, but we may properly suppose only at an extravagance of energy. In the long run, however, nothing whatever will take the place of abundant sleep, or prevent the production of a negative metabolic balance of nerve-fatigue or even of exhaustion fatal to originality and the highest efficiency later on when compelled to "obey the sterner stress" of actual life. All these things should be made part of the school-child's knowledge in such a way that they

would be part of his unevadeable subconsciousness as he grows up—as much so as the multiplication table. Whether hygiene be taught in the schools extensively enough I am not prepared to say, but it is a certainty that its intensity is far below that required to make it in the average child a real and practical thing, a fundamental rule of his own particular life. The money-value of sleep per hour should be computed by some statistician, and then the children could be taught plain facts which when repeated to the parents at home would show them that by sending Benny to bed each night an hour earlier than they intended, they could be contributing to his success in life at least as much as by compelling him to put into his little cash-register the numerous dimes that otherwise active Benny's muscles would (not improperly!) induce him to spend for sugar. In whatever way, the appeal for abundant sleep should be brought home to the child (and through him to his parents!) for without a doubt it materially conditions the normal nutrition of the essential nerve-cells.

Normal internal secretion, it may be recalled, was the second factor suggested as of importance in determination of the euphoric and efficient sthenic index. It is obvious in advance that this phase of the matter is of less practical pedagogic importance for the reason that as yet we know no physiologic (natural) way of varying the actions of these glands that pour their products into the blood-lymph currents. Moreover their normality like that of the other viscera depends doubtless on ordinary adequate nutrition of the blood.

Somewhat arbitrarily, we may choose five out of the dozen or so well-known hormones as of especial significance in maintaining normal tone in the neuromuscular mechanism, the ground of the sthenic balance. These are epinephrin (often called adrenalin), secreted by the adrenals; hypophysin, produced by the pituitary, the hypophysis cerebri; iodothyrin, made by the thyroid; testin or spermin secreted by the testicles, perhaps by their interstitial cells; and a hormone formed probably in the so-called islets of the pancreas. Through such fundamental means as vasomotion, alteration of the heart-rate, thermotaxis, determination of neuromuscular tone or activity, and carbohydrate nutriotaxis, these internal secretions control alike the vegetative and the voluntary functions of the organism. Just how this is accomplished no one yet knows, the extensive literature constituting a mass of facts and theories too intricate for ready solution. In most general terms, these chemical substances, hormones (whose very nature is as yet undiscovered), look after the nutrition

and the kinetic effective tone of the mechanism of efficiency and determine its sthenic balance. Numerous theories, more or less fantastic, more or less, too, subject to proof, have been put forth as to the relations of these and similar tissues, such as the chromaffin tissue found, in part, along the spinal column.

For example, Falta, Rudinger, Eppinger, and Chittenden have suggested that the thyroid and pancreas mutually inhibit each other, likewise the pancreas and chromaffin system, while the thyroid and chromaffin actuate each other. W. G. Maccallum supposes that the chromaffin epithelium puts sugar in circulation, that the pancreas dissolves free sugar, and that the thyroid secretion in excess interferes with this glycolysis. Whatever be the precise relations of the pancreas to muscular nutrition, so important in the will, self-reliance, and the happy efficiency of life, no one doubts that the internal secretion of this essential viscus determines the metabolism of the sugar-derived glycogen that furnishes the energy of the muscle. Thus the pancreas becomes the final arbiter, chemically speaking, of the very efficiency of the individual, of his useful will. Those of my readers who have been on the lowest plane of metabolic efficiency (after a pneumonia, a bad typhoid, a first child-birth, or in a similar asthenic state), can scarcely have forgotten that careless, helpless sense of passivity in which they seemed to float—a will-less Nirvana looking neither back nor onwards and (unless the central nerve-axis be numbed or stimulated by drugs) a condition of misery too negative to be described, the very annihilation of the personality with the personal self-reliance resident in someone else.

The far-reaching influence of the thyroidal hormone iodothyrin over the nervous system since the early work of Tizzoni (41), Blum (3), Albertoni, Edmunds, et al. demonstrating the actual degeneration of the neurones when it was eliminated, is too well known to need discussion. Physiologists and neurologists are now engaged in working out the broader relations of the secretion. Says Lorand (28), "We cannot recall any alteration of the thyroid gland that is not accompanied by nervous symptoms." Some authorities consider Graves' disease (exophthalmic goiter) a neurasthenia accompanied by tachycardia. When the thyroid-product is deficient (myxedema) there is regularly a melancholic malaise, and when superabundant a tendency to a nervous fretful kind of euphoria related to the general over-activity characteristic of the disease and which is part of a vicious circle often hard to break.

The relations of the thyroid to the sexual glands proper,

the testicles and the ovaries, has long been known to be very close. On the other hand, the hormones coming from these latter are in close relation, especially in females, with the processes of digestion, as Kretschy, Taneski, P. Müller, and Leyden, among others, have pointed out. Again, as embryology primarily suggests, these glands are nearly related to the adrenals. Loss of energy, then, and lowered vitality (accompanied with the consciousness of weakness that is always unpleasant), characterizes the loss of the internal secretions of the testicles and ovaries. This result is suggested certainly in the three chemic relationships just cited, namely with that of the thyroid, concerned with the nutrition of "the nerves," of the alimentary canal determining nutrition in general, and of the adrenals, governors of vasomotion and thereby of blood-supply. In general, vigorous sexuality makes for euphoria not less than for the sthenic positive balance proper, while defective or outworn ovaries and testicles correlate feebleness, lack of energy, and a deep-reaching malaise; according to Freud, of course sexual conditions are dominant of the whole subconscious life. However the details be one day found to be, the fact is universally appreciated that the sexual products are the most powerful of energisers, lending with strength the most substantial kind of happiness—the very pride of human life. Not only energy but bodily nutrition is closely concerned with the secretions, internal and external, of the sexual glands—as comparison of the average elderly maid and the average married woman of like age shows at a glance. And despite the implication of the over-grinding of the divorce-mill, we may properly suppose that the euphoria-malaise balance in the long run is one of greatly preponderating happiness for the married woman. Lorand (28) remarks how often in his patients "les idées noires" result from degeneration of the thyroid associated with that of the ovaries or the testicles.

The pituitary or hypophysis cerebri has secretions whose precise functions are as yet by no means understood. The organ consists of three parts, apparently distinct, posterior, intermediate, and anterior. The product of the first mentioned part of the gland apparently passes into the third cerebral lymph-ventricle, that of the second part into the neck of the posterior lobe by way of the lymphatics, and that of the last-mentioned portion into the circular lymph-sinus which is about the whole organ. The extract of the posterior lobe when injected into a homothermous animal acts (much as does epinephrin, but thirty times more powerfully) to cause a rise of general blood-pressure by vaso-constriction; sometimes

the heart-rate is lowered. Until we know more about the relations of blood-quantity and blood-pressure to brain action it is impossible to explain the functions of these internal secretions. We have none the less perfectly good reason to be sure that it has some essential action since its hypertrophy is related to acromegaly and its removal from dogs and cats results in death. Biedl (2) emphasizes the importance of the little organ in the metabolism of body-fat.

The adrenals consist of two apparently distinct parts, cortical and medullary. Halliburton reasonably supposes that the cortex plays a part in the metabolism of the lipoids, for example cholesterin and lecithin. The medullary portions of the glands exert a powerful stimulation upon the vasoconstrictor nerve-fibers about the smooth muscle of the arterioles. A one-to-a-billion solution of epinephrin distinctly affects vegetative muscle! Hoskins (21) shows that "epinephrin in remarkably high dilutions (1:500,000000) inhibits peristaltic activities in isolated segments of rabbit's intestine. In still higher dilutions (1:1000,000000) the rhythmic activity of the gut is often augmented. Quantitative differences, therefore, in the amounts of epinephrin acting upon tissues can cause qualitative differences in effect." How potent an agent these glands may be then upon the very bases of emotional tone (the vegetative organs) appears strikingly from this simple research by Hoskins. Dixon has already shown that this inhibitory action is due to stimulation of the sympathetic myoneural junctions in the smooth muscle tissue. Ascher showed that stimulation of the (sympathetic) splanchnics actuates the adrenal secretion, and Cannon and De la Paz (7) suggest that our strenuous nervous life may be in part due to overaction of these glands, although the reverse influence is by no means less probable. Mammals die in a day or two after removal of their adrenals, the symptoms being progressive asthenia with loss of vascular tone and of appetite, and with convulsions, the immediate cause of death being inspiratory paralysis. Epinephrin increases the tonus of voluntary muscle as well as that of the vegetative variety. Thus we have two basal ways in which the adrenal secretion concerns emotional and kinetic conditions—through determination of blood pressure and through its influence over muscular tone.

Such, crudely enough expressed and inadequately withal, are the writer's notions as to the main factors determining the sthenic balance of child or adult—well nourished and properly rested nerve-centers and perfectly normal, vigorous, internal secretions. Having worked several years in research on

pleasant emotion, the writer (10) is not unaware that numerous other factors, known and unknown, ignored or endlessly discussed, enter this problem. Most conspicuous of these omitted determinants of feeling, perhaps, are the important muscular activities on which probably the affective states inherently depend. Both smooth and cross-striated muscle take important part in the emotions. The external secretions, lachrymal, sexual, alimentary, etc., are certainly other factors in the agreeableness-disagreeableness balance that lies beneath the success of high efficiency effort. These need not be here discussed since the literature is easily at hand (see the bibliography in (10).

One other dominant of the sthenic index must, however, be suggested and briefly argued, namely personal effort. Progress in efficiency depends more or less on the pleasantness of the work, on attention, on brain and muscle-nutrition, internal secretion, muscular adroitness, the heart-rate, the blood-pressure, the humidity, the sunlight, and on many other things. These constitute a physiological syndrome whose meaning in the personal life is success itself. We are now studying, then, what we may term the *psychophysiology of effort*. The source of the euphoric sthenic balance, that efficient balance that makes effort successful, is not wholly impossible of description. Unless our research-observations are mistaken, all successful progress-effort is inherently and most personally *inhibitory* of movement. Effort that succeeds in raising the standard of success comes only from an euphoric balance in the total organism (spontaneous or at times compelled), and has its immediate representation in the neuromuscular mechanism in an increase of tonus both in the active nerve-cells and in the active muscles and limbs. It is then perhaps *a more or less local* (and likewise more or less general) *process of molar inhibition, expressed as a heightening of local kinesthesia and a surer, more conscious, more personal control*. If this problem is in fact complicated by metabolic inhibition, either in the nerve-cells or in the muscles or in both, as is possible, we are at least not concerned with it in this connection, for the inhibition referred to is that of movement in the gross or molar way.

The efficient balance, that is of actual energy, underlying successful effort is then probably in part central, in cord and brain (a matter of nutrition, etc., as already inadequately explained) and in part peripheral, the inherently inhibitory balance-action of opposed functional groups of muscles, with kinesthetic sensations as its essential consciousness. Only under euphoric conditions apparently is this effortful balance

of energy effective in advancing skill. These relationships having been elsewhere indicated, need not be repeated here nor applied particularly to these especial problems. Every phase of the advance tends to support W. McDougall's (29) concise statement of a long-felt tendency: "The conception towards which the study of the organism as a whole points, is that the neurones of the afferent side of the nervous system (including the cerebellum) constitute a great common reservoir of free energy in which the head of pressure varies from moment to moment with the ratio of the inflow to the outflow, and on which all efferent paths may draw in turn when they come into activity." This "reservoir of free energy" is the tension neural and muscular, represented in the effort of exact voluntary control inherently kinesthetic and inhibitory.

It remains for us, then, to learn if we can, the physical concomitants of the euphoric aspect of this balance. In the early part of this essay we have noted, or rather referred to (10) the more particularly muscular part of the reaction of pleasant emotion—general expansiveness and extensor activity. More appropriate to the present application are other bodily correlates, those namely of a nervous kind. These have been often implied by several well-known psychologists. Within four years, moreover, Max Meyer (34) has developed this implicity into an explicity in the light of modern neurophysiology, and we have the beginnings almost of the nervous correlates of feeling-tones in the general sense of the term. "We can," says Meyer (33) "distinguish two classes of conflict between two nervous processes of which one originates while the other is still going on. Either, the first is stronger, deflects the second and by absorbing it grows still stronger. This corresponds to our experience of pleasantness, for in all such experiences, however varied in other respects, we continue the same form of behavior more and more vigorously. Or the second nervous process is stronger, weakens the first by deflection, and finally absorbs it completely. This corresponds to our experience of unpleasantness, for in all such experiences our behavior suffers interference until it is completely replaced by another form of behavior, when the unpleasantness ceases. The nervous correlate of feeling may then be described in the following words. The nervous correlate of pleasantness and unpleasantness is the increase or decrease of the intensity of a previously constant nervous process if the increase or decrease is caused by a force acting at a point other than the point of sensory stimulation. The condition of the second half of this sentence is necessary because our experiences of feeling do not depend on a change

in the intensity of a stimulus, but on the interference of nervous processes in higher nerve centers." Provided we think of the alliance and the interference spoken of between sensational nervous currents as vastly complexified so that they involve practically the whole mechanism of efficiency (nerve and muscle and epithelium), a resultant or "set" standing for the whole personality at the time, this theory seems to fit exactly the probable physiologic bases of the kinetic euphoria and malaise. Indeed Meyer "helps us out" even in this, for the two sentences next to those above run thus: "Introspective psychology, disregarding behavior, for centuries has been satisfied with remarking that pleasant experiences are the experiences of helpful *situations,* unpleasant ones those of harmful *situations.* This is true enough for the animal body is so equipped by nature with nervous connections of sensory and motor points that reactions to a helpful situation continue and grow stronger, reactions to harmful situations are weakened until they discontinue." For our immediate purpose (to explain the basis of efficiency and of inefficiency) euphoria makes the effort effective even to success, while malaise lowers the effort's potency to a "plateau" or even below it to failure.

Very recently Head and Holmes (20) on the basis of data both physiologic and pathologic, have published opinions as to the sensory regions of the brain far more comprehensive and likely than has ever been ventured before. It gives us for one thing a means of neurologic discrimination between the nerve-influences that are afferent only and those that are truly sensory, and furnishes a basis for the gamut between unconscious events, subconscious experiences, and those that are clearly conscious, occupying the attention-line. "Afferent impulses on their way from the periphery to the cortex pay toll first of all to the unconscious coördinating mechanisms of the spinal cord and the cerebellum. Then, after being regrouped at the thalmic junction, they act upon two terminal centers. One of these, the essential organ of the optic thalamus, responds to all those elements which can evoke the consciousness of an internal change in state, more particularly pleasure and discomfort. Sensory impulses then pass by way of the internal capsule to act upon the cortex, and these are the afferent materials out of which the cortex manufactures the forms of sensation with which it is concerned." Lesions of the optic thalamus result in the "over-loading of sensation with feeling-tone," this exaggeration being due to the release of inhibitory control from the cortex cerebri by disease of the neurones transmitting inward. "No

one sensory quality is subserved by a single set of organs," say these always advanced researchers,—and no one certainly understands the dermal receptors and receptive fields better than Dr. Head of London.

The posterior spinal grey, the whole brain stem, the red nucleus, the optic thalamus, and upward and downward radiations between the last-named and practically the whole hemispherical cortex, constitute, it may well be, the neural basis of the sensation-fabric and its personal meaning of pleasantness or of unpleasantness. How intimately this large factor, structurally speaking, of the brain is related and interrelated to the whole nervous system needs no description here, for a glance merely at the plan of the central nervous system shows that the sensory neural outfit so accounted is at the very base of all psychomotor function. It is in direct line, this hypothesis, and goes far to explain withal, the motor basis of consciousness on one hand and, on the other, the personally affective tone of broad motosensory complexes.

In so far as encouragement from success and discouragement from unsuccess affect the development of skill, suggestion with all its complexities and perplexities comes into the problem. In a similar way of course act external encouragement and discouragement from teachers, parents, and fellows. These alike are illustrations of the far-reaching moment of the feelings in education. The delicious "co-conscious obsession" of love furnishes a common and powerful instance of the efficacy of euphoria in true personal education,—what cannot the lover accomplish with that goal before his efforts! On the other hand, of what avail is endeavor to the friendless lad or lass without self-respect or confidence in the outcome of the struggle? Not always, by any means, as we have heard, is the race to the swift or the battle to the strong—often indeed both go to the *happy,* lords of the world.

When will systematic pedagogy give the credit due to this primal phase of human, and other, life? Feeling as the fountain-head of the impulse to activity that makes and keeps us alive, merits far more attention than it has generally received in public instruction. One hears to be sure in such relation something, at last, of esthetics, but other aspects of the feeling-world are vastly more vital to the world's multitude. Knowledge of the common and fundamental life-experiences is properly part of the birth-right of every human born and should consitute, early and late, part of his systematic nurture. Understanding of the relations between his feelings and his ideas and of the close alliance between his feelings and his will, now a part of neither secular nor religious

instruction, should be part of every school-year. Not only facts and relations of the objective kind but relations in part or wholly subjective are fully requisite to proper preparation for life. The old world seems to have forgotten the earlier eternal wisdom of the wise-man: Γνω Θι σεχυτόν for they leave to the teaching of an often sad and unique experience that prudence which the human privilege of speech might make the pupil's own at a time, when it might be incorporated into the evolving habits of the personality. If a child understood his feelings (rather than felt them) better than he ordinarily does, he would be more sensitive to external and internal conditions of efficiency and therefore would the better adapt himself and be more successful, not only in the acquirement of psychophysiologic skill but in the skillful conduct of his whole life.

To return to our original motif of practical educational theory, we get down to the fundamental, do we not? when we affirm that with a much finer regard for the tones of feeling, school-children would not only less often be "attempting to put square pegs into round holes," but they would less often, too, be trying to put the pegs into the holes on triangular days, for they would on such days be allowed to listen to the call of the woods and the fields, and their hearts be glad.

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THE BINET-SIMON TESTS OF MENTAL ABILITY. DISCUSSION AND CRITICISM

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During the past year the Binet-Simon tests have been much discussed by the psychologists who desire for practical work with defectives or deviates a set of tests which will aid in diagnosis and classification of such cases. The opinions concerning the value of the Binet series range from full belief in their value as a very accurate measuring scale to a rejection of many of them for practical purposes. The former of these opinions is held by Dr. H. H. Goddard[1] and the latter by Dr. Leonard P. Ayres.[2] It would seem that a further analysis of them and of the many tables so carefully worked out by Dr. Goddard from the results of their application to nearly two thousand public school children might lead to a more judicial attitude toward them. The object of this paper is to present an attempt at such analysis.

The object of a test or a series of tests of mental ability is to aid one in a short time to analyze and diagnose mental deviates whose deviation has caused social maladjustment, and to measure in some wise the extent of deviation from the normal. Do the Binet tests wholly or in part serve such a purpose? Dr. Ayres says they do not at all serve the purpose and gives his objections as follows:

"1. They overlook the fundamental difference between the multiple and complex stimuli which contribute to the motivating impulse in coping with real problems and the few simple ones entering as factors in answering questions and obeying commands.

"2. The importance of the emotions and habit in influencing action is disregarded.

"3. Real equality is attributed to verbal equality.

"4. Ability to answer many of the questions depends upon

[1] Two Thousand Normal Children Measured by the Binet Measuring Scale of Intelligence. Pedagogical Seminary, June, 1911, p. 232.

[2] The Binet Measuring Scale of Intelligence. Some Criticisms and Suggestions, Psychological Clinic, Nov., 1911.

the child's daily environmental experiences which differ radically among different children.

"5. Ability to meet the requirements of several of the tests depends directly upon the excellence of the child's schooling.

"6. Several tests depend upon the ability to repeat words and numbers.

"7. Counting backward and solving puzzles constitute several tests.

"8. Several tests turn on the ability to express in words comprehension of difficult, abstract terms." [3]

The first two objections to the Binet tests made by Dr. Ayres could be made against any tests of mental ability. The laboratory certainly cannot reproduce the complex and multiple stimuli of everyday life. Nor should it need to do so. The function of a test of mental ability is what the term implies,—it tests ability. One of the things which we may require of a test or series of tests is to show us whether the subject can react normally to a complex situation. We may ask what is he capable of doing? What he does do from the social standpoint can be abundantly testified to without a laboratory. The treatment of a delinquent child may depend upon whether or not he is feebleminded, that is, lacking in ability or abilities which would make it possible to expect normal social co-operation. We may expect laboratory tests to determine this for us, and perhaps to determine the range of his general mental ability upon a fixed measuring scale of some sort. This latter thing is always being attempted in school and competitive examinations. It is, perhaps, not too much to expect that the psychological laboratory may now or some time provide this scale. It is not likely that tests which may take into account the effect of habit and emotion upon every day action can be perfected in the laboratory sense. Habit and emotion are themselves results and when abnormal the cause of that abnormality must be sought for in past developmental history or environmental influence, and often may be attributed to or accompany the subject's mentality, such as personal uncleanliness, or thievishness, and great excitability or apathy on the part of feeble minded persons.

In answer to objections three, four, five, six, and eight we may make the general observation that a test of mental ability must necessarily be evaluated in terms other than those of its own result. We must assume that back of the test is an ability, the presence or lack or measure of which the test discloses; that this ability may be used for other things than the

[3] Psychological Clinic, p. 193.

performance of the test itself; and that the other things or the other ways in which it can be used may be foretold. In short, there must be an interpretation of the meaning of a test. There must be an in some wise describable qualitative as well as quantitive result. The tests of this group turn, broadly speaking, upon the ability to use language. The ability to abstract the salient points from past experience for use in new situations and combinations is very necessary to success in living a normal life. To many of the processes of this nature the use of language as a medium is necessary. To be sure there are many situations in which it is either not necessary or has not yet been refined to the point of being useful. In general, muscular skill can not be acquired from another or made plain to one's self through the medium of language. The success of the child in doing the work of the school above the first three or four grades depends almost wholly upon this language ability. Tests which can adequately disclose or measure this ability should be of great value in a psychological clinic. The Binet tests of this type do not, perhaps, provide an adequate measure, but they certainly do point out one of the most important of the elements of general intelligence.

Concerning one of the tests included under objection seven Dr. Ayres says, "Counting backward is one of the rarest things most people are called to do. To teach children to recite backwards lists of words which have a normal fixed order is educationally vicious."[4] When this test is interpreted in terms other than that of its own result, it constitutes, in the writer's opinion, a very good test for the age at which Binet puts it. Back of the performance lies the ability to rearrange a bit of mental content in a new and prescribed way. It shows that the child is able to control his associations in such a way as to produce a desired result. Reciting the months of the year and the alphabet backwards are analogous tests. The test is all the more significant if the subject has never been taught to do so. In case he has been taught, the successful passing of the test would leave one in doubt of what had been measured, his ability to learn a series that some one else had made or make a new series himself. Of one of the "puzzle tests" Dr. Ayres says, "It uses for material a visiting card cut along the diagonal and asks the child to describe the resulting shape if one of the triangles were turned about and placed

[4] Op. Cit., p. 192.

so that its short leg was on the other hypotenuse and its right angle at the smaller of the two acute angles. So far the writer has failed to find any one able to describe the resulting shape."[5] This test is very likely impossible if one requires the description to be a verbal one. It is one of the situations in which language fails to be useful. The writer and others have found many people who were able to draw it. This test is, in its analysis, similar to the counting backwards test but uses content of a different sort and is more complex in that there are more things to be attended to in order to produce the desired result.

If, then, the procedure of interpretation of tests is valid, it seems from a general application of it to the Binet tests that they do constitute a measure for some of the abilities that underlie normal social functioning on the part of the individual. We may turn to the work of Dr. Goddard[6] to see how accurately and adequately they serve to measure general intelligence.

Dr. Goddard has made a distribution of the mental age with the chronological age of the nearly two thousand children to whom the tests were given.

TABLE I

MENTAL AGES

Age.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	Total
4 yrs.		1	2	2	3								8
5 yrs.	2	4	8	40	16	4							114
6 yrs.	1	0	3	29	48	69	9	0	1				160
7 yrs.	0	1	2	8	15	114	50	4	3				197
8 yrs.	0	0	2	2	1	87	86	16	12	3			209
9 yrs.						27	54	56	58	4	2		201
10 yrs.					3	15	24	19	124	27	8		222
11 yrs.					1	4	13	25	50	60	12	1	166
12 yrs.						4	10	13	42	36	39		144
13 yrs.						1	5	6	30	19	21	7	89
14 yrs.							1	1	6	5	4	3	20
15 yrs.								3	0	1	2	0	6

Showing the chronological and mental age distribution of the two thousand public school children graded by the Binet tests.

The writer has computed from this distribution table the percentages of those who passed "at age" or normal, "below

[5] Op. Cit., p. 192.
[6] Ped. Sem., June, 1911, p. 235.

age," and " above age " for the different ages. These percentages arrange themselves as in Table II.

TABLE II

Age.	Below Age.	At Age.	Above Age.
5	12.2%	35.0%	52.6%
6	20.6	30.0	49.4
7	13.2	57.8	28.9
8	44.0	41.1	14.8
9	40.2	27.8	31.8
10	27.4	55.8	16.6
11	55.4	36.2	7.8
12	72.9	27.0	00.0
13	92.1	7.8	00.0

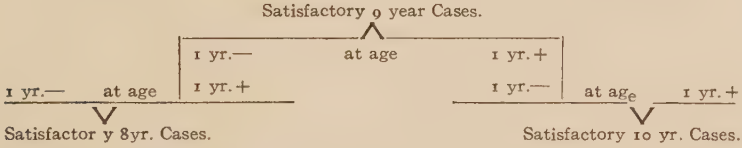
This table shows that with the exception of the seven year and the ten year old children less than fifty per cent. of any group were graded " at age " according to the Binet scale. Of the eight, nine, eleven and twelve year old children the largest group is the " below age " group; and of the five and six year old children the largest is the " above age " group. Dr. Goddard has grouped all the " above age," all the " below age," and the normal or " at age " groups regardless of chronological age and obtains a curve very closely approximating a normal distribution. Of this curve Dr. Goddard says, " The significance of these figures obtained from the general result are very great. There is every reason to believe, and statisticians confirm this, that any group of two thousand children may be taken as a fair sample of conditions to be found in any number of children to be found in any country. Consequently whatever percentages or proportions are found here may be taken to be very closely the standard to be found elsewhere." In answer to this statement we may make the very obvious objection that this curve is not made up of the measurement of one quality of an otherwise homogeneous group, but is compiled from the measure of many qualities of children of different ages. It is made up of the results of tests applied to children of different ages who may not have done the same tests, as will be presently shown. The curve can, therefore, have no statistical validity. It is merely a happy or an unhappy accident. Dr. Goddard says further, " Bearing this in mind it becomes very significant when we find that we have 78% of the children practically normal and satisfactory—for we allow those children who are one year above and one year below to pass with the central group as satisfactory children."[7] It is only by lumping the percentages again that this approximation of a normal distribution is obtained. The percentages of those graded normal according to

[7] Op. Cit., p. 236.

Dr. Goddard's standard for the different ages arrange themselves as follows:

Age	5	6	7	8	9	10	11	12	13	years.
Percent normal	77.1	91.2	80.7	90.4	83.5	76.5	73.4	52.20	31.4	%

This table shows that it is only for the ages five, ten and eleven that a standard approximating that fixed by Dr. Goddard is obtained. The twelve and thirteen year group fall below, the six, seven, eight, and nine year groups above it. The adoption of Dr. Goddard's standard is, however, hardly permissible because of the great pliability of the rule for grading the tests laid down by Binet. This rule, presumably followed by Dr. Goddard, allows a child to be graded normal or at age if he misses not more than one of the tests designed for his age. If he misses two of the tests for his age he may be allowed to substitute tests of a higher age and still be graded normal. This method gives the nine year old children, for instance, opportunity to fail on any two of the six tests for that age and substitute any three of the sixteen remaining tests. They are then graded as nine years of age mentally. The eight year old children may pass any five of the twenty two tests above those for eight years and are then graded nine years of age. The ten year old children may fail to pass two of the ten year old tests and not a sufficient number of those above to compensate and are then graded nine years old mentally. In this way we may obtain one mental age group by classing together three groups who have done different things. Dr. Goddard gives a further pliability to the method of grading by grouping together with these as normal or satisfactory two other groups who have done still other things. The problem may be diagrammatically represented as below:



The nine year group as illustrated above contains the eight year group who grade 1 year above age, that is 1 year+, the ten year group who grade 1 year —, and the nine year old children who grade "at age," 1 year — and 1 year + Thus any one satisfactory age group overlaps two other age groups and contains five groups each graded according to a standard differing somewhat from that of every other group. This is certainly sufficient to cause one to doubt the "remarkable ac-

curacy" of the system in which Dr. Goddard believes. Further doubt is cast upon the accuracy of the tests by the fact that judgments arrived at through their application do not coincide with that of the school concerning the same subjects. Dr. Goddard, himself, recognizes this. He says, "Analyzing our data so as to show where each individual is, we find that the case is not as favorable as we suggested in the previous paragraph, that many children who are normal mentally [*according to the Binet tests*] are two or three or possibly four years behind their grade. We find a great many other children who are mentally dull, not as far behind their grade as their mentality would require. We find still worse conditions among those who are ahead of their age mentally. They are not correspondingly ahead of their grade. In other words the two systems do not agree at all. Now having satisfied ourselves that the Binet scale is the most accurate method that we have of determining intellectual ability in children, the question at once arises, how much injustice is being done these children by the ordinary school routine?" The teachers of the school might well retort to this question that as they have the child continuously over a period of years their judgment of his abilities ought necessarily, in general, to be more accurate than that arrived at by a ten or twenty minute examination over very little of the matter with which the school concerns itself.

But the writer feels impelled to assert that if there were complete agreement between the test findings and school grade they would still, alone, constitute an inadequate measure of mental ability or mental development. The best possible illustration of this is afforded by the description of a boy by Dr. Arthur Holmes in a recent article, "the Classification of Clinic Cases."[8] The following is an abstract of the description of the case cited by Dr. Holmes. The case was that of a six year old boy who had been in school for six months without having made any progress in the work of the school in spite of the fact that an adult sister attempted every evening to teach him his lessons for the next day; he cried when struck by his playmates or when hurt by his playthings but did not strike back or in any way try to defend himself and would run to his mother for help; he could assemble the parts of electrical apparatus, arranging cells, wires, and bells so they would ring; could connect an incandescent lamp so it could be lighted; could start and operate a gas engine by himself. In commenting upon this case Dr. Holmes fell into the fallacy of an uncritical acceptance of the Binet tests when he

[8] Psych. Clinic, June, 1911.

said, "It presaged what was revealed by the Binet tests, namely that the boy was one year beyond the mental attainment of the average boy of his age," that is, he had passed the Binet tests for seven years. In the case of this boy were found by Dr. Holmes four distinct judgments. His sister and the school thought him a dullard; his father, with whom he worked at the electrical apparatus, thought him all right; his playmates considered him a molly coddle; and the Binet tests classified him as somewhat precocious. No two of these judgments were the result of the same set of data. The school judged him by his proficiency in acquiring the processes of reading, writing, and number conceptions; the Binet tests have nothing to do with these things except counting to thirteen and writing from copy in the seven year old tests, in either of which he may have failed and still be graded one year ahead of his age. Neither is there in the Binet tests anything which would hint at or indicate his ability with mechanical contrivances; nor that his social reactions would be as they were. Should the school and social disabilities be persisted in through life or for several years he certainly would not escape being considered a defective. It is also extremely indicative of the inadequacy of these tests that Dr. Holmes could not give a description of the case in terms of their result. He had to resort to other facts in order to present a true picture. We certainly can not agree with him that this boy had the mental attainments of a normal boy of seven years. In that case we would have to believe that the majority of seven year old boys possessed his mechanical efficiency and his academic inefficiency, which is not true. Children of six can learn to read and if children of seven can assemble the parts of a gas engine and run it without adult supervision no one knows it. In the case of this boy there was one and possibly two of his social relationships in which he failed to function properly, in his reaction to the school and to his playmates. It would seem to be the legitimate business of the psychological clinic to find why he did not. Was the defect in his school work due to a lack of ability for that thing, to lack of interest in it, or was it a result of his defective social response? And what was the cause of this latter defect?

From what has been said may be inferred the first great inadequacy of the Binet tests. While professing to test native ability they are concerned very little with the things that all children are expected to acquire and which long experience has shown they do acquire. The school is busy during the first four years of the child's school life with developing ability in the processes of reading, writing, and arithmetic. In

the old series there was no reading test before eight years and in the new series there is none at all. The arithmetic tests are a counting test, five and seven years, a test of the combination of the numbers 2, 2, 2, 1, 1, and 1, eight years, and making change for a quarter in the nine year list. The school teaches during these years more complex processes than these.[9]

Along with and after the mastery of these processes the school is concerned with their application, especially of reading, in the acquiring of systematized bodies of information, such as geography, history, and grammar. There is perhaps, one test in each of the ten, eleven, and thirteen year old group, which, if passed, would lead one to expect that the child had the abilities which make possible success in the higher grades of school work. The first of these three tests is that one which requires the making of a sentence using three given words, ten years. Binet says of this test that it tests the child's ability to invent his own expression. The second one is the absurd situations test, eleven years; and the third is the definitions test, which is rejected in the revised version, and is found in other forms in the six, nine, and twelve year tests.

The writer ventures a grouping of these tests which is the outcome of experience with them along with other tests and with usually full knowledge of the subject's reactions to the school and various social situations. The tests have been used by the writer with three groups of children, one group of about ninety children in a summer fresh air camp, a second group of about forty children in the elementary school of the University of Chicago, and a third group of about sixty defective children of subnormal and feeble-minded grade encountered in the work of the Juvenile Psychopathic Institute of Chicago, where information obtained of cases is unusually full and complete. In the work with the tests there was always felt the demand to know what was the meaning of a performance or nonperformance of a test; what the difference, for instance, between two children of the same age, one of whom could recite the months of the year and the other could not. Was the difference fundamental or superficial? Was it due to something innate or environmental? In attempting to answer these questions the tests have arranged themselves in the following classification:

1. *Those which require such thoughtful control and rearrangement of material as to accomplish a desired result.* (a). The material may be concretely presented and require

[9] Cf. Course of Study for the Elementary Schools, Chicago, 1910.

a concrete result. Such are the game of patience test, copying a square, and copying a diamond. (b). The material may be concretely presented but the result be one of imagery. These are the cutting out and the reversed triangle test of the thirteen year series, both of which have been rejected from the new series. (c). The material may be verbally presented and the result be a verbal one. Such are the counting backwards test, the use of three words in a sentence, words to be put in order for a sentence, and giving of rhymes.

2. *Those which require abstraction, comparison and judgment of material concretely or verbally presented.* (a). Those belonging to the concretely presented group are, comparison of weights, aesthetic comparisons, unfinished pictures, (b). Those belonging to the verbally presented group are, comparison from memory of a butterfly and fly, etc., problem situations, absurd situations, problem of facts.

3. *Those which are accomplishments and depend upon teaching or environmental influence as well as upon ability.* Such are the counting tests, the right hand left ear test, definition tests, age, afternoon or forenoon, number of fingers, writing, recognition of money and making of change, reading, names of colors, date, days of the week and months of the year.

4. *Those which are tests of immediate memory.* Repetitions of sentences and figures, and with these may also be classed the execution of three simultaneous commissions, though this is complicated by a problem of comprehension.

The sixty words in three minutes test must be classed by itself.

In evaluating the mentality of a case many questions come up for answer. Are we to consider all these tests of the same mental significance? In the ten year group, for instance, are we to consider the naming of the months of the year or the recognition and naming of the nine pieces of money as equal in value to the making of a sentence with three given words or the problem situations? If a child fails in the two former but performs the two latter should we say that he is lacking in some innate ten year ability? In the eleven year series, which are redistributed in the new series, are we to consider the sixty words in three minutes test equal to any of the other three tests which require constructive thought? Are all those requiring constructive thought of equal value? Is a constructive test requiring concrete material equal in value to one using representative material presented through the language medium? If there is a difference in value, when does a child develop the ability to perform that of greater value? Is a

child of five, for instance, capable of thinking purposefully with representative material as well as of performing the game of patience test? Is there, in short, a hierarchy of tests by which different grades of ability might be measured? The arrangement of the tests according to age and the practice of Dr. Goddard and others of grading backward and defective cases by years assumes that there is a course of development from lower to higher abilities. Each year group of tests, however, contains certain tests which have no equivalent ability test in any other group, and each contains tests of different type. The latter mentioned objection is not a defect, for the more types of test the better, provided we know what they mean; but it operates objectionably only along with the further objection to the method of grading. A case may by the method of grading laid down miss a test or tests of some significant ability in one age group, such as the reading test in the eight year group of the old series and still, perforce, according to Binet be graded satisfactory. By this method a lack of some significant ability may easily be masked. The revised series leaves out all reading and writing tests and thus lays itself peculiarly open to misinterpretation. The following case may serve as an example: a feebleminded boy of twelve though kept in school from the age of six never learned to read and only to write from copy, and no number work other than counting to fifteen. He graded nine years of age by the revised Binet scale, but we certainly could not consider this boy equal to the normal nine year old child who has progressed normally in the school. This boy's real disabilities were not disclosed by the tests.

In the writer's experience the Binet tests are inadequate for a full diagnosis of any clinical case for the following reasons: The concrete material tests are not sufficient in number or of sufficient grades of difficulty or complexity. The same thing may be said of the tests requiring representative material. If a subject cannot do any of the latter type of test, as is often the case with defectives, we want to know what difficulties in the way of concrete things he is able to meet. The tests of accomplishment in school work are not correctly placed in the old series and lacking entirely in the new. No distinction is made between tests which measure accomplishment due to environmental influence and those which depend upon innate abilities. The placing of the recognition of money and the months of the year tests in the ten year group are illustrations of the last mentioned objection. The naming of the months of the year is an accomplishment which has for its basis the ability to learn an arbitrary series.

This ability is not different from that which makes possible the learning of the counting series, or the days of the week, both of which are placed lower.

Both the concrete and the representative type of constructive tests should be enlarged and at least one of each be placed in each age group. If children of five can rearrange the cut card we should know whether older children can perform more complex problems with the use of concrete material of that or other kinds. There should be some form of representative constructive or reconstructive problem for each of the ages below ten. The counting backwards test constitutes one such for the eight year series. "The ability to invent his own expression" which the making a sentence using three given words discloses is in the writer's experience possessed by children younger than ten. The success of this test with different ages depends upon the words chosen. Binet uses *Paris, fortune, river;* Dr. Goddard uses *Philadelphia, money, river;* the writer uses *Chicago, money, river.* When there is failure to respond with a correct sentence the writer gives other words, *boys, school, ball or boy, river, ball,* with generally a successful result. Success with certain sets and failure with certain other sets may indicate among children of the same or different ages differences in experience or maturity of thought, perhaps, but one would certainly have to examine further than the set given by Binet before being justified in the decision that the child lacked the ability to invent his own expression.

The present status of child psychology is not such as to permit of explicit recommendations for improvement in the Binet tests or for the formation of a new series. The Binet series as they now stand would imply that certain abilities appear at certain ages that have had no previous expression. The writer's experience with the sentence with three words test shows the fallacy of this assumption for the ability which it measures. Binet recognizes that memory may be of various grades for different ages by placing memory tests of increasing difficulty for the higher ages. We must do the same thing for the various other abilities which we wish to measure or give expression to. The type of study done by Miss Isabel Lawrence[10] with the definitions tests of the Binet series is to be recommended. Such studies should be extended and multiplied. Some valuable contributions to the tests which have concrete material as a medium through which purposeful thinking may find expression have been made in the laboratory of the Juvenile Psychopathic Institute, Chicago.

[10] Psychological Clinic, Dec., 1911.

It has been the experience of the writer, and it may be added of all others who have worked in this laboratory, where practical results are demanded, that the Binet tests cannot furnish an adequate means through which to come to conclusions for the disposition, classification, or treatment of the cases which come for diagnosis. A description of one such case recently seen by the writer may serve to illustrate the objections to the Binet series for practical work.

This case was a boy, Frank, aged sixteen. Following are his reactions to the Binet series copied from the notes of the writer made as they were given.

8 year tests:

1. Comparison of butterfly and fly, etc., passed.
2. Counts backwards, passed (?) (Forgot where he was once and had to ask what had said last.)
3. Notes omission eyes, etc., passed.
4. Date, failed.
5. Repeats five numerals, passed (once out of three trials.)

9 year tests:

1. Makes change, passed (25 cts—9 cts. Instead of making the change told that one could receive it in the smallest number of pieces in a nickel, a dime, and a penny.)
2. Definitions superior to use, failed.
3. Recognizes money, passed.
4. Months of the year, failed.
5. Problem situations, passed.

10 year tests:

1. Arranges weights, passed.
2. Copies design, passed.
3. Detects incongruities, failed.
4. Problem situations, failed.
5. Three given words in a sentence, failed (*Chicago* has *money* in the *river.*)

12 year tests:

1. Resists suggestion, passed.
2. Three words in a sentence, failed.
3. Utters 60 words in 3 minutes, failed. (27 words. Pauses much, though urged to go fast.)
4. Definitions, failed. (Charity? "Don't know." Justice? "Justice of the peace." Goodness? "Gracious.")
5. Rearranges shuffled words in a sentence, failed.

According to the Binet series this boy grades nine years of age, and it might be thought is a fit candidate for the feeble

minded institution. The further disabilities which these tests do not disclose are as follows:

1. He cannot recognize any printed words and not all of the alphabet, though kept in school the regulation time.

2. He can write only his own and his brother's names. Told to write *the cat ran away* wrote *the set,* though he could spell *cat* correctly.

3. He can do simple number combinations such as 5+6, 10 — 4, by counting his fingers.

4. He knows only that his birthday comes in the summer; said, "My mother told me but I always forget."

5. He has very poor control of associations which do not provide a sense stimulus as is shown in his reactions to the opposites test. Out of 20 stimulus words he reacted correctly to only 6, gave a wrong association for 10, and failed entirely for 4 of the stimulus words.

6. He is very suggestible. In the *Aussage test* accepted 5 out of 7 suggestions.

The positive abilities which this boy possesses and which the Binet tests cannot disclose are:

1. He can do a test involving the planning of a complex set of spatial relationships in a planned and comprehensive way. This ability is disclosed by test IV. of the Healy and Fernald series.[11]

2. He has the ability to do in a planned and comprehensive way a test requiring the analysis of the functional relationships of a simple mechanical contrivance, as is disclosed by test V. of the Healy and Fernald series. He also did tests I., II., and III. of this series in the manner considered intelligent in the grading adopted in the work of the clinic.

It is, perhaps, not necessary to formulate here what is considered an intelligent reaction to these tests. This boy's performances with them ranked among the best which have been attained,—few errors and no errors repeated. The history of the boy's industrial life correlates with the inference that one might draw from his performance with the mechanical tests. He has been an efficient farm laborer for some months, worked satisfactorily for a creamery for a time loading and unloading cans, etc., and as janitor of a small school building. He is capable of earning his living without direct supervision. Without going into detail concerning them, it may be mentioned that in comparison with this boy the writer has seen cases who graded up much as he did on the Binet series,

[11] Healy and Fernald, Tests for Practical Mental Classification, Psychological Monographs, March, 1911.

could read and write, but who failed on the mechanical tests and were unable to earn a living without direct supervision. Had one gone no further than the Binet in the examination of these cases they could have been put in the same classification, but from a social and industrial standpoint they are not at all in the same class.

The scientific world is certainly much indebted to Binet and Simon for their pioneer efforts in so fruitful and necessary a field. The stimulus which they gave to the study of clinic cases has resulted in much good work being done, and will result probably in valuable additions to genetic psychology in the future.

THREE NEW PSYCHOMETRIC TESTS

By Roswell H. Johnson and Jessie McIntire Gregg

Most recent papers that have dealt with the Binet and Simon "Measuring Scale for Intelligence" have referred to the desirability of finding additional tests for the adolescent years to round out the Binet schedule.

Recently we submitted the pupils of the high school in this city to the Binet tests as a group, and took advantage of the opportunity to add four new tests in order that their value be ascertained and that approximate norms might be established for them.

1. The one which proved to have the lowest age level was an alphabet discrimination test. The subjects were shown the letters L, X, Y, N, H, drawn on a large scale on a basis of breadth one-half of height, which is about the usual proportion. They were asked to rearrange the letters in the order of length of line utilized in the construction. The results given in the table shows that the critical period seems to be 15-16, when a decided improvement shows itself. The commonest error is the misplacement of Y and X. The scoring system used was three points out of a total twenty for each unit space each letter was moved from its correct position. This test is avowedly a mixed one, involving some element of visual discrimination, ability to compare lines at different angles, but mainly a feat of mental analysis. It is believed to be a suitable test, because fundamentally similar to many practical problems in life.

2. The next in difficulty was a test in reading the time from a clock with a dial marked counter-clock-wise. The particular time chosen was 4:37. A score of twenty was given for an answer nearer than 4:35 or 4:40, ten if at 4:35 or 4:40. Fifteen to sixteen years was, in this test also, the period of greatest improvement. The subject should be asked to state the time as correctly as possible. This test, as well as the next, penalizes the subject who is prone to "go off half-cocked," which is a desirable feature, since this is a great element of mental inefficiency in those who, in some tests, show up well.

3. The third test was suggested to me by hearing that some stenographers were mentally incapable of successfully

describing or checking land descriptions. It catches the mind which is easily lost in confusion. I was unprepared, however, for the very low scores obtained, so simple does the task appear. "Draw a square. Consider it a map of a square mile with north at the top. Now draw within this square another around the SE quarter of the SW quarter of the NE quarter." This formula is printed in large letters and exposed to view throughout the test. To make it clear, a similar problem solved, involving a different one-sixty-fourth was exposed. In scoring five of the twenty credits were allowed for the correct quarter, five if in the correct one-sixteenth and five for the proper one-sixty-fourth and five points were used for correct placing and proportions. The sense element is minimized in this test and the emphasis placed on ability to follow a sequence of choices particularly open to the danger of confusion.

The greatest improvement was found at nineteen and twenty years, if the small number of cases available for those years can be relied upon. The test is properly an adult test.

4. Much the most difficult was a test which I venture to describe as Royce's Ring, as it was first employed as a psychologic test by Prof. Josiah Royce. A strip of paper about twenty times as long as it is broad is held out flat. One end is now twisted 180°. The two ends are brought up to meet, forming a circle. The subject is asked to describe the result if the band was cut along the middle of the broad side its full length. In order that the reader may test himself, I refrain from giving the solution, which is readily discovered by the actual cutting. The subject should be asked to state precisely the result. None of my one hundred and five cases were successful, although four made an approximation to the truth, if I correctly interpreted their answers, for which I credited each ten points of a possible twenty. Of about twenty adults that I have tried, only two made this same approximation, none giving a complete reply. This agrees with Prof. Royce's results, who found the test one of great difficulty.

The test involves a feat of mental dexterity which could only be achieved by a highly efficient mind, and deserves a place a step past the regular adult tests. It is, therefore, an especially valuable test. In case of success and the subject has not been a student of such "one-sided surfaces" he may be asked to describe the result of such a strip one end of which had been twisted 360°. A correct solution of both by one new to the problems, would be of great interest.

The results obtained by Abelson (*British Journal of Psy-*

chology, IV, 268), and our own experience, convinces us that comparison by the total score, especially after the twelve-year series, is better than the step classification used in the Binet-Simon system. The order of difficulty for different individuals differs far too much in the later years to permit the stress laid by Binet in his 1911 revision on any one test. We believe all the tests in the Binet series, with a few others, should be given, except those too obviously easy or difficult for the subject's age. The subject should be credited twenty points for each test which was successfully met or assumed to have been met and a sum total used. By using twenty points for full satisfaction, it is possible to give fewer points for partial credit.

In the list of opposites test, for instance, it is clearly objectionable to give either full credit or no credit. The advantages of classification by years can still be obtained by comparison with the average score achieved by the children of each age.

AVERAGE SCORE BY AGE.

Age	13	14	15	16	17	18	19	20	Total
No. of Cases	1	10	18	30	28	11	5	2	105
Test									Average Score
Alphabet	20.00	13.00	14.00	16.53	16.43	13.45	18.80	20.00	15.8
Reversed Clock	0.00	2.00	3.33	8.00	5.72	6.36	10.00	10.00	5.9
Section	0.00	2.00	2.61	1.33	1.89	1.18	4.00	13.00	1.9
Royce's Ring	0.00	0.00	0.55	0.00	0.71	0.91	0.00	0.00	.4
Total Score	20.00	17.00	21.50	25.00	24.04	21.91	32.80	36.50	23.7

THE SCHOOL LUNCHEON

By Lucy A. Osborne,
The Worcester Trade School for Girls

During the 19th century, especially the latter half of it, the school made some provision for feeding its pupils. The teachers, with characteristic devotion to their charges, found a part of them unable to do the work required through physical unfitness caused by the lack of proper food, and the school lunch was begun. This movement, in response to perhaps the most touching appeal possible—the hunger of the child, has grown up from scattering beginnings but is rapidly assuming world wide importance, and is finding expression in the laws of many countries.

In 1790, the city of Munich in Germany supported (by municipal funds) soup kitchens, to which hungry children were sent; and about the middle of the nineteenth century free meals were provided by semi-official associations to encourage school attendance. German school physicians, teachers, and social reformers joined forces to promote national legislation for feeding school children. To-day that country makes researches along the line of the practical relation of dietetics to the needs of school children; and utilizes the results of the data thus obtained.

The work has become a national matter and about half of the German cities support in some way school breakfasts or dinners. The city supplies coal, gas, clerical help, and the use of school buildings; the cost of the food is met by private as well as public funds. Breakfast is the meal usually served in Germany, as the child comes to school early—from 8.30 a. m. in winter to 7.00 a. m. in summer. Stuttgart gives a typical meal—warm milk and a roll. In the year 1907-8, Frankfurt a. M. fed 2,644 children and in 1908-9 2,896.

Germany's neighbors, Belgium, Holland and Denmark, report meals served to underfed children without cost; and justify this because of the close relation of food to education, and of both to efficiency in the adult.

Sweden, and Norway, Spain, and Switzerland, feed their children at the school—in Christiania and other Norwegian cities food is supplied by the municipality from taxation funds for all children who desire the mid-day meal. "Where

all are fed none is a pauper," they say. This method avoids many practical difficulties.

Italy had, in 1910, fifty cities giving meals to school children. More than half of these were supplied by funds from private organizations working with the city, the others wholly by the municipality. The city of Vercelli, Piedmont, has taken perhaps the farthest step in this direction; for she compels attendance at the school meal as a part of education.

France finds the *cantines scolaires* most successful. Now school meals are found in nearly every town or city, provision being made for them in the erection of buildings for they are regarded as a part of education. In 1879 the *cantines scolaires* had so thoroughly proved their worth that Paris made further provision for the proper nourishment of the child by assuming the entire cost of the school restaurant exclusive of the supervising teacher's salary. In 1908 the success of the work seemed still further assured by the fact that a large number of other schools took up like work. Usually the noon-day meal is provided, although sometimes the morning and evening meal also are given. The average cost is 3.8 cents per child. A school fund, which has been used in various ways but chiefly to support school restaurants, has been established to make the system more helpful. All of the children and ninety per cent. of the teachers eat there.

In England, children's needs were so great that teachers, local charitable organizations, as well as benevolent individuals began work where it seemed most necessary. They appealed to the public; and as was unavoidable there was much overlapping of work, and many children who were not really needy received food. The politicians and socialists took up the matter and demanded an investigation, which being only superficial yielded unreliable figures.

The London School Board took the work in charge, appointed a committee who came into power in 1900 and continued to hold office after the London County Council was formed in 1902. This committee "collects and tabulates statistics in regard to the number of children to feed and association feeding-places and puts the school relief committee in communication with the charitable association where funds may be added as needed."

Each year added to the number of schools feeding children and to the number of children fed. But the committees year by year changed in personnel, sub-divided, systematized the work, gave more attention to home co-operation, took over schools for mental defectives, blind, deaf and other special children. With experience in handling conditions it was

found some schools could discontinue their feeding. In 1906-7 fourteen and in 1907-8 twenty-eight schools, reported less meals. The committees more and more considered the general welfare of the child, and in 1907-8 they began to co-operate with the National Society for Prevention of Cruelty to Children. In 1904 a bill passed for feeding at public expense contained this interesting clause: "Where the child —living with the father not in receipt of poor law relief except under this order (i.e., school feeding) is found to be underfed, and the father is found to be able to feed it but neglects to do so, then the guardians may do so apart from the parent and charge the cost to the father if they think well to do so."

In this same year the education committee of the London County Council opened five centers for teaching cookery by preparing simple meals, to be served at cost, or given free at the discretion of the head teacher. There were suitable dining arrangements. A few months' trial showed some features of this experiment to be successful. One object here was to provide for the child whose mother was away at noon. Here again the tendency was toward free meals, the number paid for to diminish. The next year a bill was passed to provide meals for all children. The local authorities had power to raise money by borrowing, if necessary, for the equipment and service needed for the work, but they were not to exceed a small amount for food and not use even that except in extreme cases. Voluntary agencies were to be encouraged and the law for the punishment of the parent was to be strictly enforced. This was later abandoned because the parent often could not furnish food where the child really needed it and when he did not, the case was so difficult to handle. In 1905 many cities reported provision for feeding, in the school, by funds provided by municipal bodies.

The children are usually fed four or five days a week but not on holidays. Dinner is the usual meal, although there are many breakfasts. The feeding is given in periods varying from 7 to 45 weeks.

Massachusetts began the work in America. In Boston, under the splendid leadership of Mrs. Ellen Richards, an agitation on the subject of school feeding resulted in an order, by the Boston City Council, to the effect "that only such food as was approved by them should be sold in city schoolhouses." Here it was not so much lack of supply of food as the quality of that supplied which roused action. Corner groceries and push carts vied with each other for the sale of their indigestible and often unclean wares. In

1894 the New England Kitchen prepared lunches and distributed them to high schools. It assumed a responsibility for the finished product, the city furnishing apparatus for warming, serving, and selling the food. The ménus were simple and the food sold at a low price but still on a paying basis. This experiment, conducted scientifically and along educational lines undoubtedly had a most favorable influence upon other experiments following in its wake in this country. In 1907 the Women's Educational and Industrial Union assumed control, management, and responsibility of the work, with the idea of covering cost only, from the money standpoint. The work grew, and to-day fifteen high schools are served with the co-operation of the Union and the Association of Head Masters of Boston High and Latin Schools. A sample ménu is given:—

Black bean soup	.03
Creamed celery and toast	.05
Baked beans	.05
Sliced ham sandwich	.05
Chopped ham sandwich	.03
Egg sandwich	.04
Lettuce or jam sandwich	.02
Plain cake	.02
Coffee roll	.02
Banana	.02
Ice cream	.05
Cocoa	.03
Milk	.03
Apple sauce	.03

Winthrop school gave the first lunch in an elementary school in Boston. Mrs. W. V. Kellen began the work, Miss Isabel F. Hyams directing. The work grew until to-day twelve schools provide for from 2,000 to 3,000 pupils. The Home and School Association have directed the work from the beginning, through the Committee of Hygiene of which Miss Hyams was a member. A 300 calorie portion is served in one of the following combinations:—

Pea soup and crackers, potato chowder.
Corn meal mush, milk, sugar, crackers.
Oatmeal, milk, sugar crackers, dates.
Peanut butter or jam sandwich with glass of milk.
Rice pudding.
Indian pudding.
Apple sauce and crackers.
Ginger cookies, glass of milk.

These lunches were served at the morning recess and prepared at the school. This lunch costs one cent if served and cooked by the pupil under the direction of the domestic science teacher, but when a cook and some one to sell must be paid the price is two cents. The city furnishes supervision, equipment and gas, other expenses being covered by receipts.

Philadelphia has eight schools, high, manual training and normal schools, which are served with lunches provided by private individuals, usually the school matron or janitor, who make what profit is possible. In 1909 the Board of Public Education took in charge the William Penn High School through the Committee on High Schools for Girls. The results were so pleasing that they took charge of the lunches at three suburban annexes and a manual training school. A Special Committee on Luncheons looks after the work. All food, with the exception of bread, fruit, and crackers, and ice-cream, is cooked in the school kitchens. Here is a typical ménu:—

Oyster soup and crackers	.05
Macaroni and cheese	.05
Ham or olive sandwich	.05
Stewed peaches	.03
Grape fruit, marmalade, crackers	.03
Chocolate pudding	.05
Cocoa or milk	.03
Cocoa or milk, buttered roll	.05
Ice cream	.05
Crackers, two or three	.01
Dates or figs	.02
Sweet chocolate	.01, .03, .05
Banana or apple	.02
Orange	.03

The greater abundance of fruit in the ménu is noteworthy. The committee serves also a *table d'hôte* lunch for teachers for fifteen cents, and money enough is taken in to pay for the cost of food, the service of trained attendants, and a superintendent.

Nine elementary schools have lunches but they are under the direction of a Home and School League, and serve lunch at the morning recess for a penny. The dishes are as follows:—

Cocoa,
Bean soup,
Creamed toast,
Stewed fruit,
Shredded wheat, etc.

Three schools give a meal, i.e., a hot dish, bread and dessert at noon for three cents, in addition to the recess lunch. The city pays for over head charges only, the receipts pay for raw material. Labor, supervision, and other equipment are provided by the Home and School League. The children have some extras for an added penny. About half of the children, in these schools buy the lunch. But under the present regime the food must be paid for by the child, so that the poorest child, the penniless one, must needs go without. This problem is, however, under consideration. The accommodations for cooking and serving lunch are inadequate—any unused room or basement or teacher's dressing rooms where none other can be found are utilized. The woman in charge is usually a middle aged woman from her home who is glad to supplement her income with the school work. She is helpful to the children and becomes an important part of the school group.

The Starr Center Association served a penny lunch in five elementary schools in the slum district. One Italian, one Jewish, and two special schools, whose pupils are truant, backward and incorrigible boys, and one colored school; but this association joined with the School and Home League.

A graduate dietitian supervises, provides recipes and ménus, and purchases supplies. The schools make a memorandum weekly of the number and character of lunches sold. The supervisor makes a monthly balance, for the aim is to supply food at cost and close accounting is necessary. A woman at each school has charge. There is one hot dish, i.e., bean soup, creamed hominy, etc., stewed fruit twice a week and crackers of wholesome variety, as graham, milk lunch, etc., are served daily together with fresh fruit in its season.

New York City served its first elementary lunch in a school of two thousand pupils in November in 1909. There is now a New York School Luncheon Committee whose chairman and Secretary are Mrs. Ernest Poole and Miss Mabel Hyde Kittredge. Two schools were fed, with three more to be provided for, by the Board of Education. The number of schools is now seven. The lunch fee is three cents. Here a new feature comes into play, namely racial prejudice, and the lunch must be planned to meet the different tastes of the various nationalities. They also serve some extras for an added cent. Otherwise the meals follow the same line of inexpensive dishes made from legumes, rice, hominy, soup stock, potatoes, macaroni, milk, cheaper cuts of meat, etc., served in the Boston and Philadelphia schools. The city pays for gas, equipment, and rooms for cooking and serving. The

receipts do not quite cover the cost of raw material, though as numbers increase the deficit lessens or disappears.

Rochester has served a lunch at cost for seven years and its new high school building is equipped to meet this requirement by every device for serving a large number. The child pays for raw material. Most dishes are cooked in the school.

The trade school lunch is prepared as a part of a regular course in cooking usually, and here the girls estimate the cost of the articles, selling them nearly at cost. They prepare also, as at the Practical Arts High School in Roxbury, a tray luncheon for the teachers, balancing the meal as well as estimating the price. This gives also a little practice in serving and preparing a tray for an invalid.

The outdoor school is designed especially for the tubercular and anaemic children with a consumptive tendency. Here the feeding is full, three meals a day, and the child remains all day in the open air with frequent rest periods. Germany led in this movement with the now famous Charlottenburg School. England and France, in the Lyons school, followed, and America more slowly and in a different way. On the Continent and in England much attention is paid to housewifery, the girls giving practical help in the preparing of the meals The gain of these children is very marked and while the children are not watched after leaving the school the cures are thought to be permanent in many cases. That they often come from homes where all the family are poorly nourished is the testimony of the school at Mattapan, which is a successor of the one in Franklin Park, Mass. In most cases they quickly begin to do good school work which they had previously been unable to carry. In the meal for the tubercular child the cost figures much more largely; for it must meet a special need and the foods required are more expensive. When three meals are served, a total of three thousand calories is provided. Charlottenburg succeeded in doing it for twenty-one cents, but Chicago found it cost her thirty cents. There is much butter, meat, milk, eggs, etc., and children are allowed second helpings when desired.

The school lunch is appearing all over the country, from the large city school to the small rural one, where a single dish may be prepared and served to all, the pupils sometimes bringing the ingredients with no exchange of money. The above cities have been selected because they are typical, though many others might have been chosen, for there are now some thirty in the United States. The municipality usually pays for fuel, equipment to a greater or less extent and allows the use of its premises. The ménus in different schools vary only in

detail, the general outline is the same. The larger city schools often use the services of its pupils in a course of cooking of simple dishes and sometimes try to make it educational, in that, some dishes not usually cooked in the homes are prepared. There is some difficulty, at first, in selling these, but the liking soon spreads and the home is thus benefited through the pupil. The lunch may be cooked entirely by the pupil, served and sold by her under the direction of a teacher, or cooked in part, served and sold, and the lunch correlated with the teaching of cooking. But where many are to be served, it is usually much cheaper to have a woman prepare and serve the lunch at the school or send it from a center, as in Boston; and now the boards of education in Europe are controlling the work. The tendency is towards central control with a domestic science graduate or trained dietitian as manager.

There is an effort to furnish the younger children the needed minerals for growth, e.g., lime, hence the large use of milk in cooking of foods and as a beverage. Again the lunch is used to demonstrate right living conditions, and at a table carefully spread, teachers and pupils take the lunch together. This is much more often the case in Europe. Suggestions in hygiene, right chewing of food, care of the mouth and teeth, etc., can be given in a natural setting which makes them doubly impressive. The rural or village child is given suggestions as to the choice of foods for his lunch and its packing. Courses arranged as a syllabus cover the whole round of foods for a year and help the girls to see the reason for cooking certain dishes at each season. The pupils are also taught to balance the meals according to simple rules of dietary, to secure the necessary fat, carbohydrate, and protein for the proper nourishment of the body at different ages. The aim of the school lunch, at its best, seems to be "to teach that simple living, which is not cheap but inexpensive, which means obedience to the laws of health, that efficiency of body and soul may result." Simplicity and variety, as furnished by Nature from day to day and from season to season, are emphasized.

The school lunch can be made economical if prepared in a single kitchen and distributed as in Boston, but to be educational it must be prepared in the school. It can be self-supporting to a certain extent, but will not cover cost of food, paid service, supervisor, and equipment. Neither can it pay for an investigator to co-ordinate the interests of the home and the school, as is being done, for example, by the Starr Center Association and the School and Home League.

The penny lunch of England is impracticable here because of the higher standard of living. The price varies from one to six cents for serving and from one to fifteen cents for a meal. The child, as a rule, pays for the raw material only. The tickets for these lunches are of pasteboard and used but once. The same pupil does not handle cash and tickets. Often the accounting is done in the commercial department of the school, if there is one.

What does it all mean? This movement, widely extended, would not rise, grow in extent, and continue to exist without some real force, or life, back of it. The testimony on all sides is that hunger is not so prevalent as it would at first seem. Yet it is present to an alarming degree. A study of the results of medical examination of children in several cities reveal an average of 10% who are malnourished. Of the number in New York a further study showed that 68% had no regular provision for a noonday meal at home, and the night meal was inadequate to make up the loss. Dr. Chapin in his "The Standard of Living in Workingmen's Families in New York City," found in his study that a family income of $600 provided an inadequate food supply for five people. Also the school physician, who best knows the actual condition of children under his charge, asserts that the child is not so often suffering from lack as from quality of food. It is a different condition and one much less easily remedied, which confronts the teacher, the physician, and the social worker.

There are three problems—the malnutrition of the child, the ignorance of the parent, and bad housing. Because all three are closely inter-related the handling of any one is rendered very difficult. The problem of malnutrition is not new. It has long been recognized that something was interfering with the success of our public schools; some reason why children failed to make grades, why only half entering the first grade passed on to the ninth, as was the case in New York City—contrary to the common opinion that all our children have at least a grammar school education. This elementary school period is pre-eminently the age when children ought to do good work. "The senses are keen and alert. The memory is quick, sure and lasting during these years." This is the testimony of Dr. G. Stanley Hall and others. What of the waste of school funds when these children repeat grades? What of the overcrowding of lower grades until in some cities it is necessary to resort to half time in order to satisfy the requirement of the law that all children shall be in school? What of the irremediable loss to the

child of these out of the pitifully short years at best? What of the lack of preparation to meet life's responsibilities? Nor is this all.

Statistics of retardation are not correlated with those of malnutrition, although a relation is evident to any thinking person and emphasized by physician, nurse, and teacher. Facts in regard to the results of malnutrition are, however, easily obtained, and a striking instance may be given here.

In 1903 England made an investigation to explain the unsuitable condition of her recruits, and found the chief cause to be not poverty, but the ignorance of parents as to the proper feeding and care of children. Improper feeding during the years of the child's growth had not only brought about a stunted physique but had prevented the vigorous health necessary for military service. For example, among the lower working classes of York children were three and one-half inches less in height than those of the upper classes, and this carried on to manhood gave the result that some seemed to be twice as large as others. Fifty-four thousand out of ninety thousand Englishmen failed to pass the physical examination for the army. But an expert who testified to Parliament said: "There is a lack of any real evidence of any hereditary taint of strain or deterioration even among the poor population of cities. The percentage of badly born children is no greater than among the upper classes."

Many children are in a condition of low vitality as a result of accident, illness, improper feeding, and housing, children who are temporarily sub-normal, not yet abnormal, but unable to do the work in the school and without even a fighting chance for normal life. Yet if given two or three years of care and some special education they will remain normal. It costs to be sure, but what is the cost of not remedying this condition? Chiefly from these children come the unfit of all classes; for malnutrition if not remedied means colds, uncertain health, with liability to contract contagious diseases, and little power to rally therefrom. The foregoing is bad enough but is far from the most important of the results of neglected malnutrition; for a close connection exists between physical wellbeing and morality. Uncontrolled, the condition may go on to produce the truant, the juvenile delinquent, the permanently defective. What of the cost to meet the needs of these children in hospital and dispensary, juvenile court, reform, and other special schools.

Dr. Chas. Kerley of New York City says he has found the child poorly nourished was almost invariably not getting a "square deal." "The first four years of my medical life

were spent in one of the institutions for children in New York City, where there was a circulating population of about four hundred. The children were properly fed on plain suitable food, they were properly clad, they had undisturbed rest in well ventilated rooms and with but few exceptions they were strong and vigorous although they came from the decidedly lower walks of life." And he goes on to speak of the contrast between the poorly developed children of the tenement and these who were properly fed and housed. Robert Hunter says "Criminologists, alienists, teachers in schools for defective and backward children have demonstrated that lack of nourishment in the early years of life is one of the most important causes of mental and moral weakness which has come under their supervision."

The supply of food taken by an individual must go not only to supply energy for life's activities, but the larger part must be used to repair waste and, in the case of the child, to make new body material. Nature guards this growth very carefully and takes material for it, be the supply ever so scanty. It may be stunted but never entirely stopped, although the general organism suffers where there is a scarcity, and health may be permanently undermined through the weakening of important organs at this time. The supply needs to be not only large but easy of access. Dr. O. W. Atwater says that up to fourteen, four meals a day should be given. Left to itself a child both eats and drinks often. The food supply should contain fat, the carbohydrates, protein, water, and mineral salts; but the younger children need less protein in proportion to the other elements. The diet needs to be full and varied, cereals, fruits and vegetables, with much milk and less meat than is commonly given. The foods should be carefully cleaned, well cooked, and served in an appetizing manner if digestion is to be at its best to help assimilation. It is most important that the water should be where the child can get it as he wishes, in order that the organs of elimination may function properly; for failure in this is a serious cause of nervousness and perverted appetite.

While growth is in progress the child must also get his education, thus doing double work. The rule for feeding horses is "Double work, double feed." Shall the child have less care? He may go a long distance to school, often he is hurriedly roused, dressed and sent off with very little or no breakfast. Very often he cannot eat in the morning owing to bad air the previous night, or from lack of enough sleep, or nerve tension in his environment.

The school course is full indeed, but over study is blamed for much of the evil of underfeeding. The statement is made that the school must not interfere with the home, but it is equally true that the home should not interfere with the school; and it is right to expect the child to be able to do the work of the average. But the school collects the children and holds them certain hours away from food supplies and water. Should it not make some provision for these; and if colleges think it advisable to serve lunches to much older pupils with growth practically complete, may not the children be benefited by a like measure?

The study of the results of the school lunch in New York gives these figures: In March, 1909, an examination of over two thousand children showed over thirteen per cent (two hundred and eighty-three) to be suffering from malnutrition. Ten per cent had no one at home to prepare the noon day meal. Seventy-three per cent of the families represented had incomes ranging under sixteen dollars per week and thirty-three per cent were under ten dollars per week. Two hundred and twenty-four children were studied. One hundred and forty-three received the school lunch. Eighty did not. The average gain in weight was three times that for those who did not receive the school lunch during the time of the investigation (three months). This result is usually reported where statistics are kept. The gain varies but is always marked, and the child begins to lose when the lunch is withdrawn. Dr. L. Witmer is studying the relation of increase of weight to mental efficiency through the lunch in Philadelphia and will probably establish a correlation.

The objections to the lunch are many and deserve some consideration. England complains of the financial burden of increase in taxation; that it ignores the fact that the child is not a unit but a member of a group; that the parents' responsibility is lessened; that woman's absence from home is encouraged, and hence the family made more dependent on her labor; that the home is the place to remedy malnutrition.

Schools for normal children cost tax-payers much less than special schools. England systematizes the work and continues it, as do other countries. Scotland asserts that in no case has it tended to paternalism and pauperism. The London County Council reports also give an increasing number of schools which provide less or no meals with the better cooperation of school, home, and committee, showing that the tendency is to decrease. Miss Bryant reports from the Bradford school, England: "The doctrine that child feeding

would undermine parental responsibility has received a rude shock as scores of letters in our possession show that when circumstances improve parents are the first to report this to our committee, are often most grateful for what is done for them, and are anxious to make way for those less fortunate than themselves."

But the objection is made, and rightly, that this is the function of the home. But the home is often today a name merely, a shadow of that vital sharing of life and its activities of a father and mother with their children. The mother in too many cases must work also, in order that the scanty means to hold the family together may be secured. The presence of the "little mother" in our midst is a too eloquent testimony to this truth. Mr. Chapin in his book already referred to above finds that many families do not earn enough in a year to provide proper nourishment or allow the mother time to prepare meals if she knew how. Is it not a less financial burden to the state to feed such a child in school while still merely unnourished than bear the burden of a juvenile wrong doer? Is not the preparation of a lunch to be served to their companions a training in social service not to be despised? If the parent is unable, by reason of economic conditions over which he has no control, to earn enough to feed his family, shall the state say it has no duty to him or his child? Shall the innocent child suffer for lack of proper food as well as parental training because the mother must work for a scanty livelihood?

Nor is malnutrition confined to homes of poverty. There is much ignorance among otherwise well educated mothers as to the proper feeding of children, and often where the means are not lacking. The parent may be ignorant or overworked, or both, but parental affection is not lacking; for teacher, school nurse and physician testify to her willingness to learn. The parent is responsible, we say, and the courts so adjudge in all the majesty of the law, but who is responsible for the parent? "We consider the school is to make citizens," says Dr. Helen Putnam, "parents are criticised severely, but they were school children and they were not educated to be parents." I quote also from Dr. E. M. Sill: "It is most important that the coming generation of young girls should be thoroughly educated as to the comparative nutritive value of the different foods; how these foods may be best cooked to make them nourishing and appetizing and the proper dietaries for different ages and occupations. . . . As the ultimate vocation of practically all is motherhood, it is far

more important that they be educated in branches which will always be of value to them, than that their minds be filled with languages and higher mathematics. . . . No girl should be entitled to a graduation certificate or working papers until she has passed a rigid examination covering these subjects; and boys should be taught also the different ingredients of foods and which foods are most healthful, nourishing and economical to buy . . . at different ages and in different occupations, the balanced diet and how best to obtain it." And surely if the temperance workers can command a part of the time for teaching the evils of intemperance, the proper feeding of the body should have some attention. If this is done then will there be a right to hold the next generation of parents responsible for the proper feeding of their children, if the wage is a living one.

The question of feeding the child in the school seems to be settled in the affirmative for the present. It is true that the remedy is merely palliative but so are other measures for public relief, as for example, hospitals. The education of the child has been assumed by the state, and as Dr. W. H. Burnham says, the "revolutionary step was taken when public schools were provided at state expense for all children. . . . It is no more socialistic, it may be argued, to provide the proper internal heat by supplying pupils suitable food than it is to provide suitable external heat by warming the school room." Certainly, the giving of a meal as a part of education is feasible and it will not lessen the value of the child in the parent's eyes if the state and school take such interest in its welfare. The teacher gives her loyal support and the school physician recommends its establishment. He knows as no one else the dangers of insufficient feeding; but no one speaks more tolerantly of home conditions and the helplessness of the parents. Dr. Ira Wile says the "school lunch reaches to the very foundations of society." Not condemnation for the older generation, but help for the younger is its aim. Established charities meet this youngest Sister of Mercy with helping hands and give of their older experience in meeting poverty, their skill of long training to solve social problems in the most practical ways. It is true, sporadic relief measures fail but this has proved its right to existence. James Hamilton of the University Settlement in New York City says: "The child is found after careful investigation to be under nourished and of the means to relieve this the school lunch is the best."

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ARE WE TAKING PROPER CARE OF THE HEALTH OF OUR SCHOOL CHILDREN?*

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The movement to save human life is not alone a matter of mere sentiment. It pays to keep people alive. The profitable possibilities of the healthy premium-paying "risk" has in a measure counteracted the relentless spirit of self-interest on the part of the wise insurance company. Such interest, it is true, applies solely to the policy holder, but fortunately it has resulted to some extent in an appreciable reduction of the death rate among all adults.

Medical men and statisticians, carefully estimating the present annual loss of life from preventable disease, have declared that more than forty per cent of the deaths in this country are due to causes which easily could have been avoided. Healthful living habits and proper attention to sanitary conditions would have saved many of these unfortunates. Perhaps in other cases, simple, well-known preventive measures applied at the proper time might have checked the impending fatality.

Unquestionably many of the causes of death are traceable to ignorance and neglect during the period of childhood. Some pay the penalty at this early age; others suffer along, utterly unfit to cope with their healthy brothers, and are soon borne down as a result of early organic affliction.

How many parents are informed of the organic condition of their children? Do they ever stop to consider the possibility of heart or lung weakness before permitting their little ones to romp and knock about with their playmates?

Causes of Death Among School Children

It is a fact that eliminating fatality due to accident,—lung trouble and heart disease are responsible for more deaths among school children than any of the other diseases.

The mortality statistics issued by the Bureau of Records in the Health Department of the City of New York for two distinctive years, 1908 and 1910, have been selected by the

*Conclusion written by Dr. Luther H. Gulick, Director of the Russell Sage Foundation, N. Y.

writer because they represent the average as well as the median number of deaths during the past forty-one years.

TABLE I

Mortality of School Children from Organic Disease. Ages 5-15 (not inclusive)

Causes of Death	1908-1909 Male	1908-1909 Female	1910-1911 Male	1910-1911 Female	Total (two years) (both sexes)
Tuberculosis (Pulmonary)..	158	225	132	203	718
Nervous System (Brain)...	74	78	88	75	315
Circulatory System (Heart),	146	185	127	195	653
Respiratory System	176	164	144	169	653
Digestive System	108	97	118	104	427
Genito-Urinary System	57	62	53	48	220
Total.....	719	811	662	794	2986

This table shows the number of deaths from organic diseases and the specific causes recorded for school children between the ages of five and fifteen, classified according to sex.

Of those boys between the ages of five and fifteen who died during the past year (See Table II b), 9 per cent are recorded as the victims of heart or circulatory trouble, whereas in the case of the girls, the surprisingly large proportion, 14 per cent is noted. Nine per cent of the boys and fifteen per cent of the girls succumbed to tuberculosis of the lungs.

Respiratory diseases caused the deaths of 10% of the boys and 12% of the girls.

TABLE II a

Actual Number of Deaths Among New York City School Children Between Ages 5-15, Due to General and Specific Diseases and Accident, During Year 1910-1911

	Male	Female
General Diseases	470	473
Tubercular Disease (Pulmonary).....	132	203
Cancer	6	8
Nervous (Sense Organs).....	88	75
Circulatory (Heart)	127	195
Respiratory	144	169
Digestive (Intestines, Stomach, etc.).....	118	104
Genito-Urinary	53	48
Skin and Cell Tissue.....	2	1
Locomotary	16	13
Malformations	4	1
Homicide (External)	12	2
Accident (External)	273	107
	1445	1399
Total Deaths (both sexes).....		2844

TABLE II b

PERCENTAGES OF TOTAL NUMBER OF DEATHS AMONG NEW YORK CITY SCHOOL CHILDREN, BETWEEN AGES 5-15, DUE TO GENERAL AND SPECIFIC DISEASES AND ACCIDENT, DURING THE YEAR 1910-1911

	Boys. Per cent.	Girls. Per cent.
Tuberculosis (Lungs)	9.1	14.5
Nervous (Brain)	6.1	5.4
Circulatory (Heart)	8.8	13.9
Respiratory	10.0	12.1
Digestive	8.2	7.4
Genito-Urinary	3.7	3.4
Accident	18.9	7.7
General Diseases	32.5	33.8

From Table II a one notes that the male sex is more susceptible to fatal nervous and brain affection; the female sex shows by far greater weakness in fighting off the dire effects of disease of the heart.

Death due to Pulmonary Tuberculosis, or Tuberculosis of the lungs records larger percentages of victims among the girls.

ACCIDENT IS A POTENT CAUSE

Accident claims a surprisingly large proportion of boy victims. Two hundred and seventy-three boys and 107 girls were killed during the twelve months from January 1910 to January 1911, as a direct result of such misfortune.

The total deaths of children from all causes during the same year being 1,445 for the boys and 1,399 for the girls, one may easily figure that 19 per cent of the lads who die in this city are victims of their own carelessness or the common negligence of others; whereas for the girls, death due to such external cause is rather low in comparison, about 8 per cent (See Table II b).

Evidently the accustomed restraint and careful watch kept over the latter are insuring their safety. Proper co-operation of the Police Department and the Board of Education in the matter of protecting our school children from the dangers of the traffic in the congested school district would undoubtedly lessen the mortality.

Eleven children on the average per month are killed by accidents on the streets of New York City. During the past twenty-one months, 231 deaths of school boys and girls have accordingly been registered.

The principals of the schools of this city have been instructed by the City Superintendent to teach their pupils how to step on and off the surface cars and how to avoid danger when crossing streets, etc., during heavy traffic hours.

Who is Responsible?

Inadequate health inspection of our elementary school children explains the comparatively high mortality of those youngsters who, in all probability, unknown to either themselves or to their parents are the unfortunate victims of some organic disease.

A pamphlet recently issued by the Department of Child Hygiene of the Russell Sage Foundation states that, "whereas 443 cities in this country report systems of medical inspection, in only 214, or a little less than half of them does the work include a complete physical examination conducted by physicians."

A Trip With the School Doctor on His Tour of Inspection

A visit was made by the writer in company with the regular school physician to several schools to determine the actual routine of work done by the medical inspectors in New York City.

In one school, attended by 2,000 pupils, the visiting physician waited patiently for a report of sickness from the various classes. There was not one report of illness or a single case for medical investigation. This seems almost incredible. If this number of children had been previously examined surely some of them would need medical attention; and at least it would be necessary to follow up the cases of these afflicted pupils. Therefore a report of some cases for investigation or observation would be inevitable.

In another school where a superficial examination had been made on two classes of children for minor defects, not one case of cardiac ailment was reported. In point of fact the writer found out later from the parents that two of these children had heart disease.

In one case observed by the visitor, "pulmonary trouble" was registered on the Health Card but no medical attention either private or otherwise had been given. The case had been recorded three weeks prior to the visit of the school physician.

In a third school, during the routine work of superficial examination or medical inspection, two children were reported at different intervals; the first had complained of a pain in the side, the second a pain in the heart. In both cases the pupils were sent home without having been examined by the physician.

In none of the schools of New York City has there ever been recorded a complete general history of the child.

Bronchitis cases are never examined or attended. The examiner stated that "they get well within a few weeks without any treatment."

There is not time enough to make adequate physical examinations. Each physician covers the ground assigned to him in less than three hours and is paid little for the work he is doing.

To make further detailed examinations of children, will necessitate more time and therefore more pay, for the medical examiners. Unless this is provided, the present inadequate system of medical inspection will continue.

Suggested Remedial Measures

The report of the Child Hygiene Department of the Russell Sage Foundation in the foregoing reference further states that "Systems of medical inspection which include careful physical examination of all children cost the most and are by far the most valuable. From a social and economic point of view they are by far the cheapest in the better sense of the word, as they are the most far-reaching, both in their immediate and indirect results. Permanent efficiency requires skilled workers, careful administration and adequate remuneration."

Dr. William H. Maxwell, City Superintendent of Schools, in a recent address to all the New York School Principals stated that "only about one-half of the pupils in the schools are examined each year by the Health Board physician, and in only about one-half the cases in which serious defects are found are the defects remedied." Dr. Maxwell suggests that the visiting physician be induced to give systematic instruction to the teachers, that they may detect the physical defects of the children under their care.

Such examination refers only to certain physical ills as defective sight, defective hearing, defective teeth and defective breathing. Having been conclusively demonstrated that these afflictions seriously impede the children's progress in school, they, to a limited extent, have received attention.

Superintendent Maxwell also advises the transfer of administrative authority over the school doctor from the Board of Health to the Board of Education. This alone, declares Dr. Maxwell, will insure essentially a vast improvement on the present *laissez-faire* policy of medical inspection.

No complete physical examination of the entering or enrolled elementary school pupils to ascertain the health conditions of their vital organs has as yet been suggested. Table I shows that 609 boys and 746 girls between the ages of five and fifteen have died of tubercular, brain, heart and intestinal diseases in this city during the past year.

This pitiful list of victims is alarming and demands serious and immediate attention. All entering pupils should be required to present certificates of medical examination as to the general and specific organic condition of their health, or else be compelled to undergo such examination before they are admitted in school.

Careful diagnoses of abnormal conditions of the heart, lungs or other vital organs as well as thorough examinations of the urine and blood of the children now in school are necessary, before insisting that they perform the regular physical and mental exercises imposed upon them in the classroom.

Some of the deaths of our school children are due to congenital disease, others result from acquired affection. In either case timely detection of the condition may minimize the mortality. Insistence on proper medical care is essential. Prophylactic measures may be successfully instituted. By no means should the pupil with any organic defect be ordered, or allowed to enter into the exciting physical exercises and drills which would in any way be detrimental to his health. Medical counsel plus the discretion of the teacher will save many hundreds and perhaps thousands of these unfortunate children yearly.

The preceding facts outline conditions prevailing in the New York City school system. Dr. Luther H. Gulick, Director of the Russell Sage Foundation, New York, and one of the most eminent authorities on medical inspection in the United States, after carefully reviewing the foregoing report, has contributed the concluding paragraphs emphasizing the necessity for immediate remedial legislation.

Dr. Gulick on the Salaries of Medical Inspectors

" In general the medical inspection of school children in the United States is not having adequate results. A rather wide observation indicates that not one-quarter of the children who need medical attention get it. In most of the cases examinations are made and the diagnosis recorded on a card and filed away for future reference, but nothing actually happens to the child as a result of the examination. There seem to be three causes for this trouble."

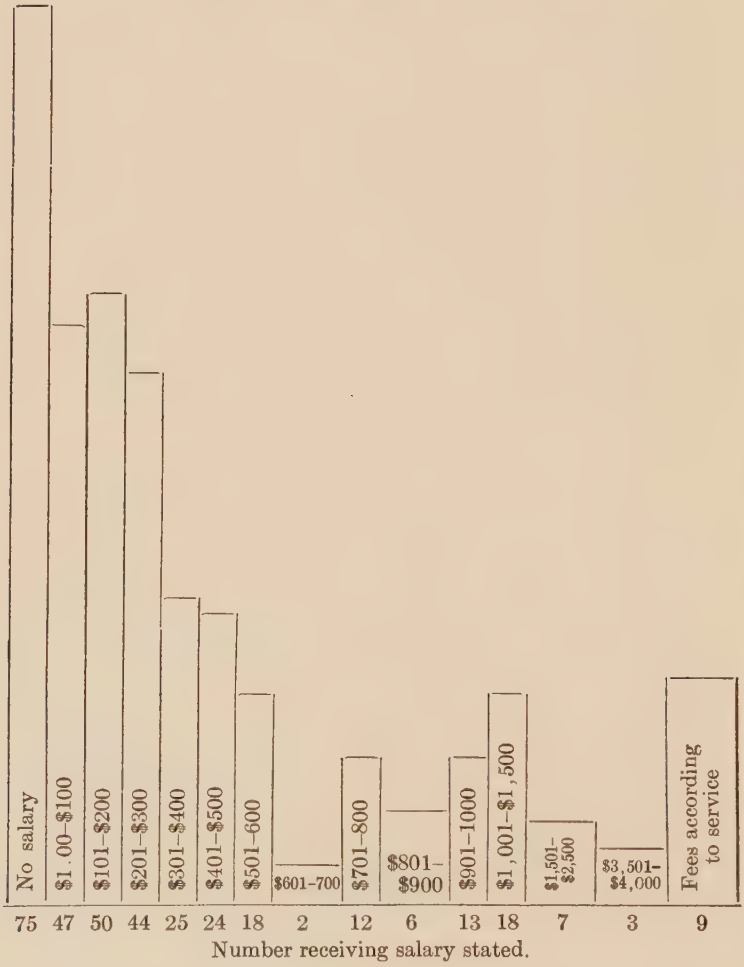
" In the first place the doctors are young and inexperienced; they are men who are not long out of the medical school, who have become medical examiners as a preliminary step to working up their medical practice; they are doing this work because by so doing they will get needed experience, and at the same time be aiding themselves financially, pending the development of an adequate private practice."

" In practically all cases, medical inspection is a doctor's

secondary interest; his main interest is in building up and caring for his own practice. He has no intention of finding a career in medical inspection of school children. He does not devote to that study the concentrated attention that a man gives to a project on which he recognizes that his success or failure in life depends."

"The doctor is not to blame for any of these conditions. The salaries paid to medical inspectors in America are absurdly small; the mean salary being about three hundred dollars per annum. The exact figures are shown in the diagram:"

CHART V.
SALARIES OF MEDICAL INSPECTORS



" It is not expected that physicians will support themselves on these salaries, or that they will give such attention to the subject as to make themselves specialists."

" In England salaries are sufficiently adequate so that able men and women may look forward to this work as affording scope for permanent careers. They are thus enabled to give their chief, if not their entire time and attention not only to performing medical inspection, but to doing it in the very best way. They are thus developing a class of expert specialists."

" The work demanded of a medical examiner is highly technical, involves the widest skill and experience. A man must be able to examine children at the rate of ten or more an hour, making quick and accurate diagnosis. This is not the work for a beginner in medicine. It is the work of a higher trained, long experienced technical specialist. For us to trust the care of our school children to inexperienced, low paid, young medical practitioners, who do this work as a ' pot boiling ' job, is unfair to the children and to the physician."

" It is true, although not so important, that there are not enough doctors to give either adequate or sufficiently frequent examinations. It is equally true that there are not enough nurses to see to it that the prescriptions of the doctors are carried out. Without school nurses, medical inspection is of relatively little value."

SUGGESTION IN SCHOOL HYGIENE

By Wm. H. Burnham

Many investigations indicate that children are more open to suggestion than adults. In all matters pertaining to the health of children suggestion is an important factor. Observation has shown that many nervous disorders are contracted by psychic contagion. Stuttering is likely to increase greatly when children enter school because the neurosis is spread by psychic contagion. Chorea, hysteria, and the like, are often spread by imitation and suggestion. A German eye specialist has reported that among the many cases of eye defect among children that he has to treat every year, he usually finds a few cases of purely functional myopia which are cured by providing the child with plain glasses or even with a spectacle frame with no glasses. Suggestion is recognized as one of the causes of suicide among children. All sorts of fads, whether hygienic or unhygienic, moral or immoral, are likely to be spread by the school.

Thus certain forms of mental and nervous disorders may fairly be reckoned among the contagious diseases. They are spread not by germs but by psychic contagion, by suggestion and imitation. Isolation of the pupils and school closure may be just as necessary as in case of measles and scarlet fever, although frequently it is better to continue the school. In any case a scientific mode of treatment in such epidemics is important. A number of epidemics of such disorders have now been reported. In many of these the chief symptoms are some form of hysterical convulsions; and imitation and suggestion seem to play an important part.

I. Epidemics of Nervous Disorder

One of the earliest reported epidemics of this kind occurred in Gross-tinz near Liegnitz in Germany in 1892 (25). The first case appeared on the 28th of June, when a ten-year-old girl without apparent occasion began all at once to tremble in her right hand and then gradually in the whole body, a condition which passed off in about half an hour without any further results. On the next day the trembling appeared in several other girls and lasted from half an hour to an

hour. Not the children sitting next, but those several seats away were affected. The trembling returned regularly each day and began to last longer and longer, and the school instruction soon suffered because the girls who were attacked could not write. One day at the beginning of July one of the trembling girls was attacked with convulsions and fell under the seat. Although the teacher immediately removed this child from the class, several new cases of convulsions soon appeared among the healthy girls, and on the 19th of July the number of victims was twenty. During the period from the 14th to the 20th of July the instruction was equally exciting for both teachers and pupils and presented a noteworthy picture to the medical observer. On almost every seat were patients having convulsions of the whole body. The girls fell under the seats and had to be carried from the room by the boys, and the attacks continued for different periods of time between a quarter of an hour and an hour, when they gradually ceased. Besides it was noteworthy that during the attacks eight of the girls lost consciousness, and after waking up knew absolutely nothing of what had happened. The coming of the summer vacation on the 27th of July brought the epidemic to an end provisionally, after 38 girls had already been excused from the instruction on the 20th of July. The vacation lasted until the 19th of August, and all the children returned to school at that time. Instruction was taken up again, and there was no complaint about trembling; but several children complained of violent headaches, which were so severe that the girls had to be sent home. After the autumn vacation, when the school began again on the 20th of October, the old freshness and joy in learning returned in the case of all the pupils, it was reported.

In 1892 Dr. Palmer reported a psychic epidemic among girls between the ages of eleven to thirteen at the Catholic girls' school at Biberach (24). One girl fell into a somnolent condition repeatedly, and then twelve other girls declared that they were frightened, and fell into such condition themselves that they could not be awakened by shaking, calling, or even by pricking with pins, although many of them were awakened by simply blowing upon them. It was a case of auto-suggestion, because the girls in their attacks did what they had heard or seen in the behaviour of their companions. They talked in their sleep, fell into convulsions, or walked about. Later the attacks became more frequent, especially at church and at school.

About the same time an acute epidemic of hysteria was described by Dr. Rembold (26). He was called to a school in

Stuttgart and found an astonishing state of things, which he reported as follows:—

Along half the length of the corridor was a procession of excited, violently gesticulating, weeping girls of the age of nine to twelve. They were in groups of two or three, in each of which one was led by another or dragged along by two. Those who were dragged usually hung unconscious in the arms of their companions, heads sunk upon the breast, and the legs dragging upon the floor. About forty girls sat around the benches in the drawing room, some completely unconscious, their eyes closed, and their limbs hanging limp. The others were weeping aloud and sighing convulsively; the remainder stared in astonishment at their sick companions. After the well girls had been sent back to their class and the excited teachers and pupils had been ordered to begin instruction again, the twenty-five weeping and trembling children were placed at the open window and with reassuring words told to breathe deeply of the fresh air and assured that this would shortly cure their trouble. In the case of ten of the girls lying on the floor this was not possible. They seemed to be in the deepest sleep, they were very pale, the breathing was deep and calm, the muscles limp, the eyes closed, the pulse somewhat weak, but of normal frequency. The characteristic symptom seemed to be a trembling of the upper eyelids, such as is often seen in the case of hypnosis. Calling and shaking made no impression. On attempting to raise them up most of them hung limp in the arms of their supporters. In the case of only two was neck and back rigid; but all apparently were equally unconscious. The method of treatment was as follows: Half a litre of water was thrown into the face of each girl successively and the order given emphatically to stand up immediately and quit such nonsense. This remedy was at once successful. Half astonished and half ashamed the girls arose from the floor and hastened to the window, except the two who were rigid. In the case of these a repetition of the water treatment was necessary, with the threat that it would not cease until this foolish behaviour was stopped.

Those who were attacked, with one exception, belonged to one class of girls from nine to ten years of age. They came from the lower stratum of society and for the most part were poorly nourished physically. They had gone to church in the morning at half past eight, and then to school. Immediately after the beginning of instruction one child without any cause had fallen unconscious on her seat, and in a short time a considerable number, altogether perhaps one-

third of the class, were attacked in the same way. The instruction seems to have been taken up again the next day, and no further trouble seems to have occurred. It was merely an instance of an acute psychic epidemic. Dr. Rembold notes the similarity between the scenes he describes and those sometimes seen where there is a public vaccination. At the first sight of the cutting of the arm and blood, one child will faint, and then several others follow, a circumstance due to suggestion.

An epidemic of hystero-epilepsy occurred in 1893 in a girls' school in Austria (*27*). In the first part of March a twelve-year-old girl in the second class of the People's School in Valle was seized with convulsions. In the course of a month a second and third girl in the same class showed similar symptoms. To avoid disturbance the girls were for a time removed from the school. Then they became better apparently, and in May received permission to return. But the attacks recurred, and two other girls were seized also.

The character of the attack was briefly as follows: The patient began to make unusual movements with the hands, complained of buzzing in the ears and dizziness, suddenly lost consciousness, was seized with convulsions, foamed at the mouth, sensation of the skin was diminished, the pulse retarded, etc. The attack lasted from five to fifteen minutes. Then consciousness returned. At first the girl complained of weariness; but after an hour felt well again. The pupils were not seized simultaneously, but one would be seized and this started the next one. As the character of the disorder caused anxiety among pupils and teachers and as its spread was apparently due to suggestion, instruction in this class was suspended for a time. When it was resumed again on the eleventh of June, two girls who had hitherto been well were attacked on the first day, and the school had to be closed altogether. The children of this school looked pale and were not developed as they should be for their age; but the parents were in general healthy; and only in one case was there indication of an hereditary tendency to epileptiform disease. It must be inferred that the spread of the disease was due to suggestion. At the time of the report four of the children had been cured. The other three occasionally had attacks of a lighter character.

The *Jahrbuch für Kinderheilkunde* reported in 1899 an epidemic of hysteria in a girls' school in Braunschweig (*28*). Forty-two girls of the ages from eight to fourteen were attacked. The patient complained of headache, laid her head on the desk, began to tremble, and sank under the seat in a

somnolent condition. The eyes were filled with tears, the conjunctiva and the whole face became red, and the girl remained for some time in this condition. Usually after half an hour she awoke and only gradually recalled what had happened. The patients were from different classes and some had never seen such attacks.

Frequently the imitation of some disease occurs, and sometimes a part of the cases are those of the real disease and some are a sort of pseudo form or a mere imitation. Terrien has maintained with many illustrations that hysterical diseases of most varied forms are only imitations of definite diseases which the patients have at some time had opportunity to see. The mere description of a disease in the presence of an hysterical patient, as he shows by illustrations, is sufficient to call for an hysterical imitation of the disease. The following are similar examples:

In 1890 Wichmann described an epidemic of chorea in Wildbad (15). Eight girls and eight boys were taken ill. Eleven cases were diagnosed as real chorea, but the other five as imitative chorea.

Dr. Kerr (7) has reported the following minor epidemic: "In February, 1907, an anomalous case occurred in a school class in North-East London. The teacher reported that a little girl in Standard II suffering from infantile palsy of left arm, broke the right arm; she was away some weeks and returned, and within a few days three children had lost the use of their left arms, and a fourth of a rheumatic disposition had such severe pains in her left arm that she held it to the side and could not be persuaded to use it. The diagnosis was clear. They were, however, examined by Dr. Hogarth. Two were of Polish extraction and all nervous children, one very ill-developed, one very affected in manner and speech, and another supposed to have heart disease. By suggestion, the children were got to move their arms freely, and the head mistress was instructed to see that they did not become paralysed again. The outbreak ended."

In certain instances we have cases that are closely analogous to the mere fads that are liable to run through any school, cases which are distinguished from the strictly pathological by the fact that there is often no neurotic inheritance and the disease occurs in an otherwise healthy child.

In 1895 Szegö (15) reported an epidemic in an orphan's home for girls at Budapest. Among forty-five children five became ill with a peculiar cough. Bókai reported in regard to an epidemic in a girls' school where fifteen girls of the age between nine and fifteen had a similar trouble. They

imitated the noises made by different animals, for example, some the baying of a hound, others the sounds made by a horse, a parrot, and a goose.

In October, 1905, a thirteen-year old girl in Meissen was attacked with a tremor or shaking of the hands (14). Soon further cases appeared, and although it was hoped that the trouble would disappear during the Christmas vacation, this did not happen, but in January and February the disease became epidemic and by the 21st of February 134 children were afflicted. The classes were then closed until the 14th of March and the parents were given advice in regard to the treatment of the children. In spite of this the number increased. On the 20th of March 237 children were suffering from the disorder. Then the number began to decrease, and on the 29th of March there were only 196 afflicted, and by the 17th of May the epidemic seems to have been at an end.

The disease was caused by seeing a child who had it; and children from all classes, strong and weak, were attacked, especially the girls. The causal factor must have been psychic infection.

Dr. Schoedel (15), school physician in the People's School in Chemnitz, has reported an interesting epidemic which seems to have been an imitation disease. On the 7th of February, 1906, two pupils from a girls' class were sent to him in whom the teacher had noticed a tremor in the handwriting. Since there were no signs of chorea or the like, the children were sent back to the teacher for further observation. On the 16th of February, Dr. Schoedel was called by a letter from the school director because in the same class eight children were afflicted. On the 17th there were thirteen, on the 19th, seventeen, and finally out of the thirty-five pupils, twenty-one. They were of the age from nine to ten, and from families of the middle class, officials, artisans and laborers of the better class.

The tremor affected the children only in their writing. In the first days of the disease they began to write well, but after a little while would always have the tremor. In the later days of the disease the trembling continued throughout the whole of the writing, and finally quite grotesque writing forms were made. The change was shown most strikingly in some of the work in reckoning, the figures showing the characteristic tremor. This ataxia of the arm and hand movements occurred in none of their other work. The children performed their gymnastic exercises and their manual train-

ing work without disturbance. Signs of nervousness or of strain or of excitement were not perceptible.

The disorder was clearly caused by imitation. The history of the epidemic was briefly as follows: The similar disorder in Meissen that consisted in a hand tremor was reported in the newspapers as a tremor disease. The child in Chemnitz that was first taken ill had heard about this disorder at Meissen, and the child had an idea of what the attacks would be like because her sister had had chorea in the previous year. That is, the first child got the suggestion from the account of the disorder at Meissen. The teacher very likely, when she first noticed the tremor, expressed the hope that the children would not get the trembling disease that they had at Meissen. These suggestions accounted for the first case. The others imitated this child; and it is noteworthy that the order in which the children sat in the schoolroom was such that those who contracted the disease could see the writing of a child who suffered from it.

Again it was not the mentally or physically weak children alone, but the healthy children, that were attacked. Among the twenty-one patients seven were ranked as good by the teacher, thirteen as medium, and only one as bad. The epidemic was checked in eight or ten days.

The effective method of treatment in such cases seems to be again suggestion. Schoedel treated the children with a strong electrical current, which is an excellent medium for suggestion. The first sixteen children were cured in eight days. With the electric treatment suggestion was given also. In place of the writing hour, for a whole week severe exercise in mental arithmetic was given, and at the beginning of each hour of drill in arithmetic the children were told, since you are not able to write you must unfortunately have mental arithmetic again.

II. School Closure and Special Classes

As regards the treatment of the more serious disorders of this kind the question naturally arises whether it is better or not to close the school when many cases occur. Especially instructive as regards this point is the comparison of two epidemics that occurred in the city of Basel in Switzerland and the mode of treatment in the two cases. The circumstances were briefly as follows:—

In 1893 in a girl's school in Basel an epidemic of this kind broke out, and this was made the subject of a special study by Dr. Aemmer (1). The chief symptom of the dis-

order was a hysterical tremor. This attacked especially the weaker and more nervous children. The school was clearly the focus of contagion, and the desire to get rid of school work seems to have been an important factor in causing the disorder.

The presence of psychic contagion was obvious. Dr. Aemmer concluded that the epidemic was chiefly due to imitation. The cases were concentrated. The disorder spread from those first attacked into other classes. It decreased during vacation and broke out again after vacation. The attacks were rare or ceased altogether as soon as the children were kept at home. There was often a relapse when they returned to school again. The disease frequently appeared among children who had before been healthy when one of the sufferers had an attack in the immediate neighborhood; and when one child had an attack others did also. The trouble continued for a long time.

By what seems to have been a remarkable coincidence a similar epidemic of nervous convulsions broke out in the same school about ten years later, namely, in 1904* (23). The epidemic continued for four weeks. The cases occurred in fourteen different classes. The age of the pupils who suffered was from eleven to fifteen. The characteristic symptom was a quick vibrating tremor usually in the right hand and in the right forearm. The predisposing causes seemed to be often anaemia, or nervous heredity; but in many cases they were indefinite. The immediate cause in most cases was imitation or auto-suggestion, although it was reported to have been fright in a few cases. That the desire to get rid of school work was also a predisposing cause seems to have been clear.

On the 11th of June, the report was first circulated that the tremors had broken out in the girls' school and that they would get six weeks for the summer's vacation. In one building the rumor was that there would be six weeks of the summer's vacation if 300 pupils had the tremors. On the 13th of June it was reported that two pupils in one school had been sent home on account of the tremors. On the following day two further cases occurred, in another schoolhouse also two more. The number continued until altogether there were twenty-seven cases. The age of the pupils was from eleven to fifteen. The largest number (15) were at the age of fourteen.

The school officials, however, had learned wisdom. Instead

*For a more complete résumé see *Ped. Sem.* 1910. Vol. 17, pp. 524-533.

of sending the afflicted pupils to their homes or closing the school the announcement was made that school would continue in session as usual, and it was made clear that the contraction of this disorder would not be a means of escaping from the work of the school.

The method of treatment was very interesting. Dr. Burckhardt proposed that they should not exclude the afflicted girls from the school, but form them into a special class and have them instructed separately from the other pupils. Accordingly a small room was taken for the purpose, and a special teacher opened the class on the 17th of June, and this was continued for four weeks.

Special care was taken of these pupils in the special class. The hours were short; the pupils worked from quarter past eight in the morning until half past nine, and then there was a recess for half an hour; then they worked from ten to quarter of twelve, and there was no further work until from quarter past two until quarter of four. The children were given warm milk and bread for a lunch. They had simple gymnastic exercises beginning with free exercises. Ten simple arm and hand movements were employed. The instruction covered all the chief branches of the curriculum. Care was taken that the children should not be overworked. There was only one case of negligence. There were few cases of absences, namely, only four out of 444 half days, only one absence for illness.

A great deal of common sense and psychological insight was used in the treatment of these cases. The calmer children were placed in the front seats. The children were not questioned or punished or blamed on account of failure in their lesson.

School work was not much affected, except in some cases the penmanship and arithmetic. The pupils of this special class seemed to enjoy their work. They were reported as being very happy, and they seemed to develop a certain group consciousness and group spirit. They named their class the *Zitterklub Konkordia.*

A single concrete case is described as follows: The patient E. S., was a girl of thirteen years of age, weak and anaemic. On Friday, the 17th day of June, she came home carrying her right hand, which trembled violently, in her apron. The mother scolded her for acting so like a fool. This had the effect on the quiet timid girl of making the excitement all the greater. The nervous twitchings appeared in the face also when the child attempted to answer; and this tremor in the face continued for about an hour. The mother, who

could not understand why the movements could not be repressed, firmly bandaged the child's arm. The tremor did not stop but pain in the elbow joint ensued.

On the 18th of June, E. S. came to the special class. She trembled so violently that writing was impossible for her. She was unable to answer the easiest questions and could not work with one-place numbers in arithmetic. On Monday, the 20th of June, during a conversation during the ten o'clock recess her arm was unobtrusively massaged by the teacher, whereupon the movements became weaker. On Tuesday, the 21st of June, toward evening the tremor ceased. On Wednesday the pupil was calm and a surprising improvement in mental activity ensued, so that her performance was in no way behind that of her classmates. On the 24th day of June, she was dismissed from the class; and no more convulsions occurred.

The wisdom of the special classes instead of school closure seems to have been clearly demonstrated. The epidemic was soon over. There were only six cases of relapse.

The noteworthy thing in regard to this epidemic was that the treatment was purely a pedagogical one. The checking of the spread of the disorder was brought about by isolating the patients; and the cure of the individual was brought about by general improvement of the health, by talking to the patient, by regular occupation and by distraction of attention. Strengthening of the will and making the patient forget the tremor were helpful. In every case mildness and patience were necessary; great severity was harmful.

This study is instructive, not merely because it indicates how similar epidemics should be treated, but also because it suggests a helpful mode of treatment for what may be called certain moral, or immoral, epidemics that frequently occur in the school. It is noteworthy that a second epidemic occurred at Meissen in January, 1907, and at this time the school was not closed, but a special class was formed; that is, the method used at Basel so effectively seems to have been adopted at Meissen.

It should be noted that apparently some of these disorders are not hysteria but rather merely examples of the spread of a minor nervous disorder by imitation. Two things are typical of hysteria; first the inherited neuropathic tendency, and second the acquired hysterical character. It is noteworthy that sometimes the children, in Chemnitz for example, were for the most part healthy, well nourished, happy children. They did not show a neuropathic character, and the disorder could hardly be called hysteria.

Some dozen epidemics of this kind have now been reported in Europe. Similar cases have probably occurred in this country, although none so far as I know have been reported; but the epidemics of fright that have sometimes occurred among the foreign children in the schools in New York City resulting from rumors spread abroad on the occasion of medical inspection or the like are to be classed as similar phenomena.

III. Minor Epidemics and Fads

Many borderline cases, some of them clearly pathological and others merely imitations of diseases, pseudo forms of the more serious nervous disorders, and epidemics of fads and the like, have been collected by Dr. Small (18). Two or three examples are as follows:—

Among a group of girls about twelve years of age, "L—— had an attack of hysterics in school. While watching her several other girls began to show the same symptoms. L—— was carried from the room and the teacher threw water in her face. The same treatment had to be used with several others."

Of a group of girls between the ages of seventeen and twenty the following report is given: "The lesson for the day was not well prepared by the class. The teacher was exasperated and spoke some sharp words. At the close of the lesson a girl had hysterics and, five minutes later, seven others were affected."

Again it is reported that "In a certain school, where the girls were from twelve to fifteen years old, one girl fainted and four others fainted from pure sympathy."

Of a group of boys it is reported: "A *jumper* (so called because he would jump or speak when touched or addressed suddenly), once went to a school that I attended. Before he had been there half a term, five or six of the boys were very bad jumpers."

A young lady writes: "I once had a teacher who had a habit of twitching her mouth. I never could look at her without unconsciously twitching my mouth in the same way. At last I could not look at her at all during a recitation. Other girls felt just as I did, and some who said nothing were imitating the teacher."

Among a group of children from ten to fourteen years of age, "One little girl in a school had a spasmodic cough. Her laughter always ended in a fit of coughing. In a short time the majority of the children in the room began to cough in the same way. They could not seem to help it."

Hundreds of such cases could probably be collected.

In still more subtle ways pupils give suggestion to each other,—in matters of discipline, in the ordinary class recitation, in plays and games, in fact in all the associations of school life. Every teacher could report cases where some bad habit of pronunciation, or the use of certain improper words, or other bad habits, have spread like epidemics when once started in the school. The examples cited merely show in large letters the force of suggestion which is always present where children are together,—a force to be considered in all methods of discipline and instruction as well as in hygiene.

IV. Crime and Suicide

The influence of suggestion in morals is not a matter of indifference to hygiene. Observation shows that just as fads and certain forms of disease are likely to be spread by suggestion, so also, habits and customs of moral or of immoral character are likely to be spread by suggestion. Interest in health, the practice of many sports, and the useful activities of the Boy Scouts are all spread by imitation and suggestion. On the other hand bad habits and crime are likely to be spread by suggestion. The detailed description of crime in the newspapers and popular literature is a serious factor in spreading evil by psychic contagion. Especially is this true when the details of crime and the life and behaviour of criminals is so depicted that it casts a halo about the criminal and makes him appear in the aspect of a hero. Recently a self-confessed criminal, guilty, if sane, of a most heinous crime, was executed, and the career of the man and his life in prison were worked up by the papers to the character of a drama, culminating in the final execution, when the criminal was represented as going to his death as a gentleman, playing the part of a man, being the bravest man ever sent to death from the Charlestown prison.

If we could rid ourselves of the old ideas of punishment as meeting the demands of justice, and look at the matter distinctly from the point of view of its effect upon the morals of the community, it is obvious that such a drama exploited in the newspapers is likely to have grave results by suggestion in the minds of the young. By the accounts of such a case many young people are abnormally excited, and not a few Sentimental Tommies are liable to become criminals as a result of such reading merely from psychic contagion.

Another psychosis has been the subject of a good deal of investigation, namely, suicide among children. This has now been studied especially in France, Germany, and Russia (*12*, *22*, 19). Apparently the number of cases of suicide among

school children has increased in recent years, and in Russia, at least in the higher schools, the percentage of suicide is greater than in the general population. Proal (12) has made a careful study of suicide among school children in France, and among the causes of such cases he finds many connected with the school and the child's reading, and he emphasizes suggestion and autosuggestion as an important influence.

It is specially important, according to Proal, to control the reading of children. Suicide is often suggested by what they read. He recommends placing thoroughly optimistic literature in their hands, and he condemns literature which expresses a pessimistic view of the world. Pessimism and nervous weakness very often go together, and especially in the case of students are likely to appear in the times of nervous overstrain. There is grave danger of the spread of suicide from the suggestion given by detailed accounts of cases in the newspapers. It is recognized that it is a means of contagion, not only in the case of adults, but in still greater degree among children. Napoleon I is said to have striven energetically against the publication of accounts of suicide, since a case was known to him in which a thirteen-year-old child took his life under the impulse to imitation from hearing of the suicide of other children.

Proal maintains that to discourage a child, to say to him that he has poor ability, bad character, and will come to no good, may even paralyze his force and take away from him the purpose to improve. The most demoralizing thing is the thought that he is doomed by inheritance to a certain fate. Brieux urged an intelligent young man to avoid the intemperate use of alcohol. He answered: "Why I am the son and the nephew of inebriates and am doomed to the fate that ruined my father." On the contrary, Proal takes the modern view that pathological inheritance is in the form of disposition only.

The one thing which stands out specially perhaps in Proal's study is the enormous power of suggestion, and especially of auto-suggestion which has its source in the child's belief in his own power. As Meumann points out, the child's belief in his own strength, his confidence in himself, and the subjective conviction that he can overcome the difficulties and handicap of his own character, even in the case of perverse children and those pathologically endowed, can have an extraordinary great influence; and inversely, mistrust in self and discouragement have an injurious effect on development. The significance of the factor of inhibition is not sufficiently appreciated by present pedagogy. It has both positive and nega-

tive significance. In the positive sense the significance of self confidence for the moral and intellectual development of the child has not been as yet fully recognized. In the negative sense the unwholesome effect of the inhibition of the child's will resulting from lack of self confidence is something that teachers as a rule have scarcely a suspicion of.

The close connection of these phenomena of inhibition with suggestion is discussed by Meumann. The methods of the school and the demeanor of the teacher are very liable to cause a state of depression which in case of neuropathic children is the soil for the extreme neuroses of which suicide is the most spectacular.

V. Suggestion and Inhibition

Meumann (11) illustrates the dangerous rôle which inhibition may play in the mental life of children by the following concrete example:—

A child that he knew entered a new school. His former teacher, who had an antipathy towards the thirteen-year-old boy, introduced him to the new teacher in a tactless manner and blamed the pupil. From this moment the boy, who had been distinguished up to this time, could do nothing more. Not only did his intellectual performance decline from day to day, but his attention and behaviour became bad, his affective life became shy and depressed, at the end of the year he was not promoted; in a word, the boy would have gone to pieces if his parents had not taken him away from the school. In the new school the teacher treated him trustfully, and from this moment on the boy was transformed in all his activity; became obedient, had excellent marks, and left the school as one of the best pupils.

Meumann gives this case as typical in that a single definite inhibition of the will suddenly entered into the boy's whole life, discouraged his self confidence, depressed his spirit, and decreased all his performances both intellectual and moral. If such a child does not have a change of environment, or if he does not have the strength of himself to rise above the checking influence, he is ruined for his whole life. Meumann says he has observed this repeatedly, and Herr Kankeleit, a teacher in Königsberg, reports that such cases are common in school practice.

Meumann distinguishes two kinds of inhibition or arrest of the will in school as well as in home education. One is temporary appearing in a single performance and the other starting perhaps with a single event or a definite kind of action

spreads and affects the child's whole mental life. Illustrations of the first kind he reports in experiments on children in the Psychological Laboratory at Zürich. If a child is required to perform an experiment, for example, the learning of a series of twelve nonsense syllables, and gets the idea during the learning that he cannot accomplish the task, then the number of repetitions is enormously increased and learning is extremely difficult. But if the same child once succeeds in mastering the material, if he gets the conviction that its strength is equal to the task, from this moment on, the number of repetitions decreases and continuous learning of the nonsense syllables begins. This is noticed still more strikingly in the case of experiments in immediate retention in the case of both children and adults. With confidence, for example, an observer can retain seven words without error, with eight words suddenly a radical fall occurs or only one or two words can be reproduced. With nine again more are retained. The explanation given by Meumann is that with eight words suddenly the feeling comes that the series is too long, the attention is arrested at a definite word, for example the seventh or eighth, and the observer forgets all or nearly all which had before been impressed upon him under favorable conditions of attention. Thus the arrest has a retroactive effect, it disturbs even the impressions that have been normally impressed upon the mind.

In cases of chronic and general inhibition the process is somewhat different although essentially the same phenomenon. As a rule it begins in the case of a performance of a child in a definite subject, for example, in arithmetic perhaps. A child begins to be neglectful on account of false treatment by parents or the teacher or as a result of failure or by the influence of fellow students. His performance first degenerates only in this one subject, but a changed relation between him and the teacher now occurs; both lose their mutual trust, and the child in himself. Soon all his work degenerates. Lack of self confidence, lack of trust in the teacher and lack of confidence in the child on the part of the teacher set up a vicious circle and the child goes to pieces, or is seriously injured for his life.

As Meumann points out, all this is very closely connected with the phenomena of suggestion. The child who is easily open to suggestion is of course liable to be influenced either to self confidence or to self distrust; and, as a matter of fact, nearly all children seem to be very suggestible. The arrest may be brought about by suggestion or by auto-suggestion. Sometimes it is brought about in the first place by

suggestion from the teacher and then afterward by auto-suggestion in the child's own habitual activities.

Of course from an educational or moral point of view both the child with extreme self confidence and the child of the depressed type are defective. The virtue is the mean. But from a purely hygienic point of view the danger in the school seems to be especially that of undue inhibition. Mr. Breese has rightly maintained that the function of the school is to direct motor activity not to inhibit.

VI. Suggestion as the Teacher's Function

The psychology of suggestion lies at the very heart of modern reform in pedagogy. So much has been said in a commonplace way about the example of teachers, and so little psychological analysis has been made, that we are apt not to see the significance of the truth expressed. What does the teacher really do in the schoolroom anyway? This would be an interesting subject for investigation. Of course the teacher's function would have to be studied in a two-fold aspect: first, what the teacher does unconsciously and indirectly; and second, what the teacher does consciously and directly.

As I look back upon my own school life and try to recall what my teachers did for me, as far as memory serves it seems that they did surprisingly little. They kept the pupils in the school quiet or tried to do so, and in this way made the conditions more favorable for study, and they let me come out from my seat two or three times a day to tell them what I had learned. I think of only one teacher who gave me much instruction until I entered college. Doubtless these teachers did a great deal more for me than I remember, but the one thing especially they seem to have done is this: they, in some way, gave the suggestion that learning is a vitally important thing and thus stimulated the pupils to work for themselves. This is perhaps, after all, the best thing the teacher does for the children anyway. The whole work and atmosphere of the school suggests that learning is an important thing, and this is the more emphatically suggested perhaps when little is said about it directly.

First, and perhaps most important then, is the subtle suggestion of example. It is well-known that children copy the example of teachers that they like. One of Mr. Russell's pupils reports that when a child she had a teacher whom she greatly loved and tried to imitate the peculiar manner of walking that this teacher had. As the trick was somewhat difficult to acquire she practiced walking in the cart ruts be-

cause that made her imitate her teacher's gait. Another reports the case of a boy of five who went to school for the first time. "Soon after, his mother noticed that he had a peculiar squint when very much in earnest. She found later that he got the habit from his teacher." Such imitation is very common, and even in less obvious ways the same influence is seen. The nervous teacher is apt to make her class nervous, the teacher who is calm and restful usually has a quiet and orderly class. Second, the teacher is constantly giving suggestion by questions. A question is a suggestion; and the experimental studies of the psychology of testimony have shown that children are more suggestible than adults to questions.

Again in matters of discipline the force of suggestion is apparent, and considerable care must be taken in the formation of rules lest by the indirect method of suggestion a rule may tend to produce the fault condemned rather than to correct it. It is very easy to make a rule in such a way that it at once suggests to pupils the breaking of it. Great care should be taken too in fighting bad habits, or else the very means taken to eradicate them will increase them. In a matter like the smoking of cigarettes, for example, the teacher may talk against this habit in such a way as to suggest smoking to pupils who have never tried it in their lives.

We may oppose drinking, secret vice, and the like, among boys in such a way as to suggest the very thing we would hinder. "An experienced master in one of the most famous English public schools wrote some years ago of secret vice among boys: 'When I first came to ———, Dr. ——— was making a crusade against this failing; boys were sent away wholesale; the school was summoned and lectured solemnly —and the more the severities the more rampant the disease. I thought to myself that the remedy was creating the malady, and I heard after from an old boy that in those days they used to talk things over by the fireside, and think there must be something very choice in a sin that braved so much. Dr.——— went, and under ——— we never spoke of such things. Curiosity died down, and the thing itself, I believe, was lessened. . . . When it is combatted from the monkish standpoint the evil itself becomes an epidemic.'" (5).

Moral instruction is tremendously important, but we may overdo it. The teacher attempts a systematic use of suggestion, but it should be remembered that primarily he is merely one of the social group, and the suggestions given by the teacher may be suggestions either of the similar or of the

contrary. From the peculiar position of the teacher as the leader or ruler of the social group, he has a certain advantage; and yet, on the other hand, he is open specially to the danger of giving contrary suggestions. Every teacher knows too well that a prohibition, for example, is likely to suggest to some children an almost irresistible impulse to perform the forbidden act. If a teacher does not appeal to the instinct of imitation, he is likely to appeal to the instinct of opposition, if we may call it such. There is bound to be suggestion in any case.

Finally in the whole work of instruction suggestion is the legitimate function of the teacher, and distinctly in harmony with the demands of modern pedagogy. "The great maxim of modern reform in education is the activity of the pupil instead of the didactics of the teacher. There are but two methods of instruction: as regards the pupil, the active and the passive; as regards the teacher, the method of demonstration and the method of suggestion. The active method has been most completely adopted in the kindergarten occupations, in manual training, in the laboratory, and in research at the university. But, with the modifications made necessary by different subjects, it should be adopted generally. The teacher should suggest; the pupils should act."*

The bearing of these studies on the teaching of hygiene should be noticed. In all hygienic education the emphasis should be placed upon training rather than upon instruction, and the importance of avoiding unhygienic suggestion is obvious. For children it may well be said that the study of personal hygiene is itself unhygienic. The investigation of one's own health, like the analysis of one's own wit, is liable to injure it. Both children and adults are liable to injury to health from suggestion. This is, perhaps, particularly so in mental hygiene. The man who is mentally overworked is told that he should not think so much, and this perhaps stimulates his thought. He is told to sleep more and the very effort to sleep keeps him awake. He is warned perhaps that the constant repetition of a certain train of thought leads to madness, and the warning itself tends to make these ideas insistent. Probably most of us know individuals who apparently would recover their mental health if they could escape from the burdens of the simple life and the effort to live hygienically. The school physician and the teacher must always be on their guard lest they develop an unwholesome self consciousness or some form of hygienic pedantry.

The study of child hygiene and school hygiene is primarily

* See an article by the writer, in *The Forum,* June, 1898, p. 491.

for the teacher rather than for the pupil. Every teacher should study this subject above all others, in order to safeguard the health of the pupils; but the children may well be left in ignorance of it as much as possible. As a matter of fact we find this astonishing situation in many of our schools. The children are required by law to study hygiene. In some cases perhaps this is the only subject the law requires, but the teachers, except in a small percentage of cases, never have had the opportunity to study the part of hygiene they especially need, namely, school hygiene.

What children should receive is not primarily hygienic instruction, but hygienic training. The whole instruction and discipline of the school should be so ordered as to develop habits of healthful activity; and yet hygienic training is rare, hygienic instruction, for the children at least, is common. It is much easier to show pictures of the drunkard's liver and disordered stomach than it is to give training in the habits of health. Some instruction in hygiene, it is true, the children should have, but this will come better incidentally to training in hygiene.

The result of this grotesque method of instructing the children in hygiene and leaving the teacher with little opportunity for such instruction, has had unfortunate results. Among these have been the inability of the teachers to appreciate the hygienic point of view, to see when their pupils are suffering from physical defects and disorder, or from an unhygienic environment, such as dry, overheated, stagnant, atmosphere; and not infrequently the teachers have intensified unwholesome conditions such as fatigue, excitement, nervousness, and the like, by suggestion. And further the result of this has been in some quarters a hostility to hygiene on the part of the teachers. The idea is prevalent among many educators that hygiene has brought about a mollycoddle attitude toward children which is leaving them without stamina and without efficiency. The late Professor Paulsen of Berlin seems to have held something of this view. He represented the position of those who would call a halt in the teachings of hygiene in regard to overpressure, fatigue, and the like. Such writers, however, merely emphasize what hygiene teaches,—that care must always be taken to avoid arousing morbid self consciousness and the spread of unhealthful attitudes and nervous disorders by suggestion.

Conclusion

Suggestion must be reckoned with in all hygienic observations. Many persons feel more comfortable and allege that

they have fewer colds when they keep a vase filled with water on the radiators, although the amount of moisture evaporated is so small that it is not likely to increase appreciably the relative humidity. The guest in the old story breathed more easily after he had smashed the window in his room, although it proved to be only the glass of a bookcase. One of the best antidotes for fatigue is suggestion; and in certain recent investigations it is hard to tell to what extent the results found are due to suggestion. And in all our scientific experiments that have to do with human comfort and health, how much we must discount the results on account of suggestion, we do not know; but they who do not reckon with this factor are liable to a serious source of error. In the whole field of school hygiene, theoretical, experimental, and practical, the psychological point of view is important; and the often neglected factor of suggestion should receive careful consideration by teacher, school nurse, and school physician, and investigator.

The investigations that have been cited emphasize the following points:—

1. Many nervous disorders are spread by psychic contagion.

2. The immediate means of the contagion may be the sight of another child suffering from the disorder, or the suggestion from hearing an account of the disease, or reading about it in the newspapers.

3. The most effective method of cure is suggestion and pedagogical treatment. When there is a single case the patient should be removed from the school and isolated. When an epidemic occurs the best method seems to be the establishment of a special class for the children who are afflicted.

4. Crime, suicide, as well as bad habits, fads, and the like, are spread by psychic contagion.

5. The means of suggestion faults may be the example of pupils or teachers or it may be a description given orally or in the newspapers.

6. The best method of treatment is, on the one hand negative, the avoidance of occasions that would lead to the bad habit, crime or suicide; on the other hand positive, the suggestion of healthful activities, the development of wholesome interests and the stimulus of success.

7. The legitimate function of the teacher is suggestion. This is not only of primary significance in teaching and discipline, but also of tremendous importance in the whole hygiene of instruction.

8. It seems necessary that children with more pronounced neuroses like stuttering, chorea, and the like, should be excluded from the school, or, where conditions make it possible, educated in special classes.

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RECENT EXPERIMENTS IN COMMITTING TO MEMORY

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It is, perhaps, safe to say that no mental function has occupied the attention of more investigators than has "memory." Since its entrance into the experimental field, with the incomparable painstaking pioneer study of Ebbinghaus, no year has failed to turn out quantities of data, more or less carefully collected, and almost no psychological laboratory has neglected this rich mine of mental phenomena.

The problem has been attacked most often on its quantitative side. The nature of memory curves and curves of forgetting have been obtained by:—

1, the "unaided recall" method; 2, the recognition method; 3, the saving method; (No. of repetitions required for relearning); 4, the *Treffer-methode,* or method of right associates; 5, the measurement of time required for recall.

Other quantitative determinations have been concerned with:

1, material of different degrees of complexity; 2, material presented to different sense departments; 3, the influence of age; 4, the influence of general intelligence.

The literature on the subject of economical learning was very adequately summed up by Meyerhardt in an article published in the *Ped. Sem.,* June, 1906. His bibliography comprized twenty-five titles, and his review sums up the work of Ebbinghaus, Müller and Schumann, Ephrussi, Jost, Steffens, and other well known investigators. Very briefly, the conditions generally agreed on up to the year 1906, as being the most favorable for memorizing, were:

1. Learning by the "whole" method,—or by the so-called "mediating method."
2. Learning accompanied by half-loud speaking—except in the case of pronounced visualizers.
3. Learning with rhythmic speaking.
4. Using memory aids peculiar to the learner's imaginal type.
5. Judicious distribution of repetitions in voluminous material.

6. Adjustment of the reading and speaking rate to the progress of the memorization.

The purpose of this paper is to summarize the results of the most important experimental studies undertaken since 1906.

I. Methods of Presentation and Learning

A. *Sense Departments*—Several important experiments are concerned chiefly in determining what kind of stimulus,—whether visual, auditory, a combination of both, etc.,—is most favorable to learning and retention.

Pöhlmann (29) made an extended investigation in this field, using familiar, significant material: two-syllable names of concrete objects, concrete objects themselves; and non-significant material: nonsense syllables and numbers. 60 observers took part in the experiment—all pupils from 9-14 years of age,—10 of each year. The material was presented but once, and reproduced immediately. Six different methods of presentation were employed:

1, objects presented visually; 2, objects presented visually and their names pronounced; 3, names presented visually; 4, names pronounced only; 5, combined visual and auditory presentation of names; 6, combined visual presentation and pronunciation by observer. Pöhlmann finds:

I. Retention of objects much better than that of words.
II. Results with *auditory* presentation better than with visual, with *significant* material.
III. Combined auditory-visual-motor, poorest of all.
IV. Visual presentation gives best results for nonsense material.

The second of these results has been challenged by several investigators, chiefly by Meumann, who holds that Pöhlmann treated his data very inadequately by lumping the results of all his observers, instead of taking account of their ages. A close examination of his figures reveals the fact that only the younger children gave better results with auditory presentations—the older ones doing decidedly better with visual material.

Pöhlmann believes, as does Meumann, that pupils should be taught to use all sorts of presentations though not forced into uneconomical methods, e.g., visual presentation proves very superior in securing the retention of entirely unfamiliar material, like nonsense syllables, therefore, Pöhlmann would have it employed in the learning of a foreign language. He believes the recent fad for auditory and vocal methods here are purely one-sided and unwarranted.

Von Sybel (37a) worked with the same problem in view as did Pöhlmann, though with several distinct differences in method and procedure. The work was undertaken under carefully controlled conditions, in the psychological laboratory at Göttingen. He employed only nonsense syllables, using a combination of the committing method and the method of right-associates, presenting his series in visual, visual-motor, auditory, auditory-motor, visual-auditory, and visual-auditory-motor fashion.

His seventeen observers were all adults—most of them psychologists of rank—all students and scholars. His data show a great superiority of the visual-auditory-motor presentation over the visual in all cases, even with pronounced visualizers, except when the rate of presentation is very slow—where silent reading proves better. Auditory presentation alone gave better results than visual alone in all cases.

In evaluating this experiment from a pedagogical point of view, it is necessary to note that these results were obtained from adults, having years of training, and that they are not yet proved applicable to children.

Henmon (13) was interested in this same field. His article contains a good review of the literature as well as an account of an experiment of his own, carried on at the University of Colorado in 1908-09. His observers were six students and assistants in the department of Psychology—each having had at least one year of work in the psychological laboratory.

He employed both meaningful and nonsense material: concrete nouns of 4 letters, two-place numbers, and nonsense syllables. The series were typewritten, and exposed on a kymograph, ¾ sec. being allowed for each member, with an interval of 1½ sec. Four different modes of presentation were used:—

1, visual; 2, auditory; 3, visual-auditory; 4, visual-auditory-motor.

Each series was presented once, twice, and three times. The results are computed on averages for ten experiments under each of these heads, for each different material, and for each of the three numbers of repetitions.

Henmon finds:—

I. That auditory presentation is best in almost all cases —strikingly better than visual though all but one of his six observers were predominantly visual in type. This is in striking contrast to Pöhlmann's results for nonsense syllables. Henmon, however, points out the many chances for error in working with groups of school children,—their unfamiliarity with nonsense material (some of which, as used by Pöhl-

mann, contained diphthongs and diagraphs, and so were more difficult both to pronounce and to apprehend from oral presentation). He might well have invoked the difference in age and training, also, but he contents himself with noting that, though Kuhlman's review of the literature, in the *Psy. Bul.*, 1908, leads him to conclude that visual presentation of nonsense syllables is always better than auditory, yet careful experiments by Kemsies, Hawkins, and von Sybel, as well as his own, lead him to a contrary result, i.e., that auditory presentation is superior.

II. Visual-auditory presentation is superior to visual alone in 87% of cases.

III. Visual-auditory-motor is *inferior* to visual-auditory in 59% of the cases; is inferior to auditory alone in 55%; to visual alone in only 15%. Therefore a simultaneous appeal to several sense departments at once is of no advantage. Pöhlmann agrees here.

IV. The relative value of the different modes of presentation remains unchanged for one, two, or three repetitions.

V. The individual differences in amount retained was high, even in so small a group of observers. These differences remained constant for various modes presentation—contrary to expectation. The correlations in abilities with different presentation modes was practically perfect—a fact quite opposed to the general belief that superiority in one sense department means inferiority in another. The correlations between abilities with different materials were not as close as might have been expected: e.g., the correlation between concrete nouns and numbers was + .20; the correlation between syllables and numbers was + .77; the correlation between syllables and nouns was + .77.

Thorndike (38) sounds a note of warning against too loose a conception of the function of the visual image. In a class experiment where he had students answer questions as to the appearance of things with which they were thoroughly familiar, he found the average superiority of good over bad visualizers (as determined by various tests) to be — .048. Another proof, he says that the "intellect is not a logician working over data turned out by a copying machine." Thorndike does not make it clear that his "good visualizers" were very adequately tested.

Kuhlmann (19), in a careful study made at Clark in 1906-07, makes out quite as bad a case for the merits of the auditory consciousness.

Two kinds of material were used:—

1, Verbal discourse; 2, Familiar sounds,—ringing of a bell, low of a cow, dinner gong, etc.

Graphophone records were made for the purpose, and two presentations given the subject. This was found to be just sufficient to enable him to recall the record immediately. Four weeks later, the character of the sounds being entirely forgotten, a second series was given, with three repetitions. A third and a fourth series were given at intervals and always, before and immediately after the sitting, the observer gave as good an account as he could of his memory of the sounds. The auditory memory proved very scrappy and faulty. In nearly every case of recall, other imagery accompanied the auditory images. In semi-passive recalls, visual imagery came up first in 53% of the cases; auditory in 35%, and motor imagery in 8%.

Segal (34) attempted, by the use of different methods of presentation, to make a complete separation of the auditory, visual, and motor sense memories. But he used far too few observers to warrant the sweeping generalizations which he makes, or the pedagogical applications which he proposes—the chief of which is that every learner should keep to his own individual type of imagery.

It is evident from the want of agreement shown in the studies so far described, that the first problem attacked in this review is still far from a solution. More extended experiments are needed before we can say whether visual, auditory, or some other sort of presentation is the best for such and such learner of such and such material. Data a little more convincing than any here mentioned have been obtained in the field of spelling instruction, though here also problems still await solution.

B. Time Intervals—An extended experiment was made by Bergström (3) at the University of Indiana, to ascertain the effect of different time intervals on the memorial process. Thirty students in the psychological laboratory, having worked there almost an academic year, served as subjects in the first experiment. Two kinds of material were used: lists of ten associable words, and series of ten letters arranged in accidental order. The series were read with intervals of 0, .5, 1 and 2 seconds. Each series was read once and the subjects were asked to write down immediately all they could remember of the list. From this and like data, Bergström concludes that, "The acquisition and retention of a series of familiar associable words varies approximately as the logarithm of the interval at which the words are spoken, the

shortest interval being that which barely permits a clear pronunciation."

Another set of experiments, where series of twelve nonsense syllables were employed, gives more reliable data. An exposure of something over 1 and ½ seconds was found to yield the best results, the rests between the series lessened the errors. The length of these rests was not satisfactorily determined. Bergström concludes that while some sort of mental working over of the material is evidently advantageous, the length of the period doubtless depends much on the material and on the learner.

Reuther (33) arrives at similar conclusions, though by a very different route. He employed the "recognition method," requiring his observers to read four-place numbers which he showed them later, noting how many were correctly recognized. The subjects did not know that the second series was the same as the first. Intervals of from ½—3 sec. were used, with five intermediaries. Unfortunately, only three observers took part in this experiment. Two of these found the lengthened interval advantageous, while the third obtained the best results with a one-second interval.

Reuter also experimented with the rest periods, trying 4 sec., 1, 2, and 5 minutes. The rests seemed increasingly beneficial. This agrees with Jost's results.

A careful experiment on time intervals was made at Clark in 1907 by Smith (36). Seven laboratory students served as observers, the material being nonsense syllables, exposed on a drum. The syllables were printed at irregular intervals on the slip, and all the subjects without exception succeeded in reducing them to some sort of rhythmic grouping. They reported that they had to do so before they could learn the series.

As a final test, 6 series of 12 syllables were spread out over a paper 42 feet long, so that the distance between them was never twice alike in the 20 repetitions of the series! (The spaces varied from ¾ in. to 10 in.) Yet each observer secured his rhythm from the group.

As to time intervals, then, the data on hand show something like agreement. A rate just slow enough for reading to be easily possible, with a not accurately determined interval between presentation is most advantageous.

Rhythm is universally accepted as an enormous aid to memorizing.

C. Methods of Learning—Several important experiments have been made in this field. They concern the *Treffer methode;* the "whole method"; the most economical unit for learn-

ing; primary and secondary aids; the relative value of repetitions just sufficient for a perfect immediate recall, and accumulated repetitions, and the like.

Neumann (27) conducted an experiment in 1907 which seems to give a more or less authoritative answer to the question concerning the relative advantages of the "part" and "whole" methods. His observers were five *Realschüler* from nine and a half to ten and a half years of age. His material consisted of carefully chosen French and Latin vocabularies. He employed the *Treffer methode* in all experiments and set up the following rubrics under which he grouped his results:—Tr. = *Volltreffer* (a correct reproduction). Fr. = *fastrichtige Reproduktion* (an almost correct reproduction). V = *verstümmelte Reproduktion* (a distorted reproduction). O = *Versager* (wrong).

In summing up his results he allowed a one-half count to a reproduction which he judged Fr. and a one-fourth count to a reproduction which he called V; that is to say, if an observer gave two reproductions in the course of the series which the experimenter classed Fr., these were counted one Tr. or correct reproduction; and in the same way, four V's equalled one Tr. Neumann admits the chance of error here but believes that the care which he took to keep his judgments uniform reduced this possibility to a negligible factor.

Experiment I. The Economy of Learning by the Whole ("G"), Part ("E"), and Mixed ("M") Methods. The first group of experiments included ten series of Latin words and their French equivalents. Each of these was composed of three different parts—in the first, a vocabulary was learned as a whole (the "G" method); in the second each word was learned separately (the "E" method); in the third the vocabulary was learned by combination (or "M" method). The order of the methods was varied so as to avoid the effect of practice. In each single experiment, seven words containing in all forty-seven letters were learned. The experimenter took care to have an equal number of different classes of words (nouns, etc.) in each series, and rhyming and obviously associable words were ruled out. The vocabulary was written on the blackboard by the experimenter, the French word first and opposite to it its German equivalent. Then the boys entered the room and the experimenter read the complete list aloud three times, after which the boys read it in chorus. Where the "G" method was employed the entire list was read through twelve times by the class; where the "E" method was used each pair was read through twelve times before the

next was taken up; with the "M" method each pair was read seven times and then the entire list five times. After the last reading, the board was erased and each boy was given a slip of paper, dated, bearing his name, on which was written the German meanings of the words just learned in the order given; he was to write the French equivalents. 24, 48, and 72 hours later the same was repeated to determine how much was retained. Neumann seems to have made no provision for preventing his observers from noting a part of the material as they entered the room, and perhaps in this way vitiating some of the results. It would seem that a method might easily have been devised whereby the series could have been exposed instantaneously and taken from view in the same manner.

Excellent and detailed tables show his results, which briefly summarized are: The "whole method" is best for learning, and especially for retention; the mixed method, part and whole, is next in order though nearer to the 'part method' in its results than to the 'whole;' least satisfactory is the 'part method.'

Experiment II. Where Reproductions are Required in Changed Order. Three months later, Neumann conducted a set of experiments practically identical with those just described, except that the German words on the printed slips given the observers (on which they were to write the French equivalents) were set down in changed order. Neumann wished to ascertain whether or not the results of experiment I, held for material where the original order was not preserved. The general result turned out to be the same though details differed considerably; e.g., the "whole" and the "mixed" methods produced practically the same number of *treffer* the same day, though for the second and third, and especially the fourth day, the advantage was decidedly with the "whole" method. The results show unequivocally that the "part" method gives the poorest results here also.

Experiment III. The Economy of Learning from the Standpoint of Time. Neumann notes that previous experiments (Cf. Meumann (23)) have shown that the same number of repetitions by the "whole" and "part" methods do not require the same length of time. Neumann proposes to investigate the time required using the same procedure as that already described, except that the time used from the beginning of the readings by the observers to the end was taken with a stop watch.

It was found that the readings by the "whole" method took slightly longer; e.g., ten repetitions of the entire series by the

" whole " method required 4′ 59″; ten repetitions of each pair of the series required 4′ 15″.

This is easily accounted for when we remember that in the former case the attention must pass each time to a new word; the eye has a new fixation point and the organs of articulation must be adapted to a new set of pronunciations. The question then naturally arises: given a constant time, what will be the relations of the two magnitudes? To answer this, Neumann compares the results of ten experiments with each of his observers in each method, keeping the time constant for both at 4′ 15″. He found that the " part " method admitted of twelve repetitions in that time for each observer, and the " whole " method an average of 10.4 for each observer,—the average deviation being 1.68. The total number of correct reproductions for each observer in the two are as follows:

O	I	II	III	IV	V	I–V
E	28	55	24	34	16	157
G	33	54	25	35	18	165

Evidently the " whole " method has proved itself clearly the superior of the " part method " as the number of syllables correctly remembered is not only considerably greater for the entire experiment but also for every individual case except one, where the difference is so small as to be more than easily accounted for by the probable error.

Neumann notes great individual differences in his observers, and in drawing his conclusions is careful to state that while the " whole method " has shown decided advantages over the " part," there is much variation in the degree of this advantage from individual to individual, owing to their natural endowments and to the nature of their memory performances. The individual who learns easily shows the advantage of the " whole method " at once, the " hard " learner shows it later and after practice.

Thorndike (39) made a very interesting experiment on the memory for right or paired associates. He explains his interest in this field by noting that this is the kind of memory we employ in associating events and dates; a name and a face, object, book, place, etc.; appropriate words with each other; equations like $7+2=9$, etc. He had twenty-two senior and graduate students learn 1200 German words with their Eng-

lish equivalents,—taking 100 or more for a practice period of one hour,—using any method they chose. There was an immediate recall; a recall after several days; and after a month or more. Several things of interest came out of this experiment.

I. As to the rapidity of the formation of associations between pairs. (a) In cases of 100-200 words to be retained for fifteen or twenty minutes, from 23-177 were retained for immediate recall after one hour's study. (b) In cases of 1000-1100 words to be retained for three or four days, the average is approximately 1030 words after thirty hours' study.

II. As to permanence of retention of paired associates. An average of 576 words was retained thirty-seven days after a 1200 word test, as a result of twenty-seven hours' study. The central tendency seems to be to a loss of 1/20 in an hour; 1/10 in three days; 4/10 to 5/10 in forty days. There was nothing to indicate Ebbinghaus' loss of 1/2 in one hr., and 2/3 in one day. All but two of the subjects learned 90% of 1200 words in from 2–5 repetitions of study.

III. As to relation of rapidity of learning to permanence of retention. Thorndike finds a correlation of + .40 between the amount learned in an hour which was retained for fifteen or twenty minutes; and the same correlation between amount retained for three days which was retained for forty days.

He concludes that quick learners are good retainers. There are too many chances for error in the method here, to consider these results as more than indications. For example, much of the learning was done by the students in their own rooms, the time left to them to note and record, as also the number of re-learnings which each series received. Granted the best will in the world on the part of each of these twenty-two students grave slips must necessarily have occurred.

Two investigators, Pyle and Snyder (31), interested themselves in ascertaining the most economical unit for committing to memory. Their investigation extended over six months and shows fairly conclusively that whether 5 or 240 lines of poetry are to be memorized, the "whole method" is better than the "part." The saving is relatively greater in case of the long selections. The authors themselves served as observers in the experiment, but since only Snyder was able to work systematically, only his results are given. The material was taken from Longfellow's 'Translation of Dante's "Divine Comedy",' a poem new to the observers. The unit varied all the way from 5 to 240 lines. Altogether 2500 lines were learned by the observer. The unit selected was read

aloud at an even natural rate. As soon as the observer thought he could repeat some from the beginning, he did so, reading on from the place where he had halted. A period of from 40 to 50 minutes was found to be the longest practicable, hence longer units were spread out over successive days, —each day all the parts previously learned being re-learned with the 60 and 120 line tests, parts already learned being repeated once each day and at the end the entire unit repeated until the whole could be given from memory with 240 line units.

Detailed tables show the result of the entire experiment. Here is a summary of the main findings:

20% saving occurred by using the "whole method" in 240 line tests;

17%, in 120 line tests;

20-22%, in 60 line tests;

11%, in 20 and 50 line tests.

Introspective accounts show the variations in the percentage of saving to be accounted for adequately by the difference in concreteness, connectedness, etc., of the material. These conclusions were confirmed by tests made on public school children in learning Bryant's 'To a Water Fowl,' the tests being made by Miss Ida E. Graham, a student in the University of Missouri. Introspections as well as objective results showed the bad economy of periods longer than 40 or 50 minutes; the parts learned tended to drop out where the periods were longer than 50 minutes, especially in the first 10 to 15 lines. It was found practically impossible to memorize over 50 lines at one sitting. The authors believe that the chief factors contributing to the economy of the "whole method" are:

I. A removal of the interference of associations, particularly the association of the last line of a division with the first line of that division, instead of with the first line of the next.

II. Avoidance of the forgetting of parts already learned.

The general pedagogical conclusions from this study are evident. The "whole method" is the best for economical learning. If the piece is too long to be learned at one sitting, it should be divided into parts which can be learned in 30 to 40 minutes, and then some device to hold the separate parts together should be committed to memory.

Kraemer (17) reports an extended piece of experimentation carried on in Meumann's laboratory. He attempted to discover the nature of the progress of psychic factors in the learning process in order to establish the real essentials which

lead to retention of nonsense material, numbers, letters, Italian vocabularies, poetry, and philosophic prose.

Kraemer's purpose was to do this for meaningful material chiefly. Above all, he wished to build up a faultless method of learning by heart.

The materials used were parts of Locke's 'Inquiry Concerning the Human Understanding;' an equal number of Kleist's 'Michael Kohlaas,' (prose narrative and description) and selections from Hume. Kraemer discusses the difficulty of equating such material qualitatively for different observers, the ideal of course being to find stuff of like construction and sentence parts, which yield like helps to all and whose content is of like difficulty for each learner.

The experiment was always carried on in the forenoon, the observers having the best disposition for it at that time. Test experiments were first given to establish the initial memorial capacity of each and to investigate the method most desirable. The "fractional" method was first tried, i.e., the material was imprinted as a whole and after each reading the observer gave a written account of what he understood and what he retained. Kraemer believed that this method would prove most efficient for his purpose, as it would show how the material already learned shaped itself and was imprinted until an errorless reproduction from memory was possible. The method proved bad, however, as the learners found it unpleasant to have to reproduce after one reading, and time was lost. So the following method was tried: Each observer was given nine selections of prose (17 lines in each), seven from Locke, two from Hume, one of each to be learned each day until he could repeat it faultlessly. Each part learned was repeated after 24 hours. The reading time of each was taken by a stop watch. The tempo was left to individual preference, the object being not to mechanize the process. The "whole method" was employed though not in its most extreme application. A reproduction was required of the observer at certain times before the learning was completed,—each reproduction being set down with the total number of readings. The number of readings between reproductions differed for the different observers according to their quickness. This enabled the experimenter to see what parts of the material were learned first and what last. No errors in the reproduction were corrected by the experimenter, lest such correction emphasize certain words and fix them in mind. Three different kinds of instruction were given with three different materials:—

1, Note equally the words and the sense; 2, note the sense

first until it is well mastered, then single words and sentence construction; 3, note the words only.

The experiment shows how accessible different observers are to these different instructions. Only adults served in the experiment, five members of the Academy, all very much interested in the procedure. Meumann himself observed in several series. A careful examination was made of the memorial and imaginal type of each observer. A summary of the extensive tables shows the very great advantage of learning by content over learning by rote. This matter of noting the thought content Kraemer calls the "primary aid" to learning.

TABLE I

NUMBER OF REPETITIONS IN LEARNING PHILOSOPHIC PROSE

		Observers																			Selections
Sense & Word Learning	For 1st. Imp.	I			II				III			IV			V						1, 2, 3
	after 24 hrs.	22	30	30	18	27	27	15	25	31	20	27	25	30	034	31					
		5	4	4	3	5	7	5	6	6	4	4	4	5	5	5					
Sense Learning	For 1st. Imp.	25	27	26	19	25	16	16	23	13	19	24	20	28	27	26					4, 5, 6
	after 24 hrs.	3	5	5	4	3	3	4	6	5	5	6	3	5	11	10					
Word Learning	For 1st. Imp.	56	51	40	36	34	25	58	57	38	24	26	16	42	49	52					7, 8, 9
	after 24 hrs.	6	5	3	7	7	4	15	13	7	8	3	2	8	21	8					

TABLE II

TOTAL NUMBER OF REPETITIONS FOR EACH LEARNING METHOD

Observers	I	II	III	IV	V
In word and sense learning	82	72	71	72	45
In sense learning	78	58	52	63	81
In word learning	147	95	153	66	143

Note that sense learning takes least in every case, word learning takes most in every case.

A careful analysis of results at different stages of the learning of descriptive prose shows that the "sense method" is

best here also. The "sense-word method" will imprint the sense word for word in a number of places, but only by a greater number of repetitions. The "word method" is poorest, requiring more repetitions and often being logically cloudy and in confused order.

TABLE III

LEARNING OF DESCRIPTIVE PROSE

Observer	I			II				III			IV		Selections of Material
Content and Word	15	14	14	12	15	15	13	11	12	11	12	15	19, 20, 21
	4	4	4	4	3	4	3	2	3	2	3	2	
Content	13	15	6	14	12	10	4	10	7	13	12	11	22, 23, 24
	3	4	3	4	5	4	5	2	2	3	5	2	
Word	42	39	38	19	21	14	40	44	34	18	17	13	25, 26, 27
	4	4	3	5	5	6	4	5	6	3	3	4	

Evidently we have here a phenomenon explainable by the nature of the learning process itself. The *content* of the material is the weightiest factor in the learning, and if the attention is not divided between content and word, by the instructions, the learning is faster.

Kraemer makes a close analysis of reproductions at various stages, showing how the content gave consistency to the learning, and how various aids,—visual, auditory, etc., according to the type of the learner,—appeared as the learning progressed.

THE LEARNING OF PROSE NARRATIVE

TABLE IV

NUMBER OF REPETITIONS IN LEARNING PROSE NARRATIVE

Observers	I			II			III			IV			Selections		
Sense and Word Method	16	17	23	12	12	17	13	13	12	9	13	12	12	11	12
	3	2	3	3	3	4	4	3	2	2	2	4			
Sense Learning	15	16	17	11	13	11	12	12	11	12	10	10	13	14	15
	3	4	4	4	4	4	2	3	4	3	2	2			
Word Learning	43	40	38	22	13	16	24	23	21	13	13	13	16	17	18
	3	3	4	3	6	6	5	4	5	4	4	4			

TABLE V

TOTAL NUMBER OF REPETITIONS FOR EACH LEARNING METHOD

Observers	I	II	III	IV
In sense and word learning	56	41	38	34
In sense learning	48	35	35	32
In word learning	121	51	68	39

Kraemer's conclusions are:

I. In memory experiments hitherto undertaken, the nature of the learning process, especially in meaningful material, has not been observed. Such an investigation is possible, from the first presentation of the material to be learned until an errorless reproduction of the same. The chief aids, as well as the possible distractions, can be investigated.

II. Three different learning methods may be used: (1) Content and word, (2) Content, (3) Word method.

III. The chief and most necessary aid to acquisition and retention is the full understanding of the content. The experiment shows the different stages through which the learning progresses:—

1. Adaptation and Orientation.
   The learner becomes acquainted with the contents of the text. One reading often suffices for this, according to familiarity of the observer with the material in hand.
2. Passive "taking in." (*aufnehmenden.*)
   The material (visual, auditory, motor) is acquired, the type of the observer determining the secondary aids. The sense of rhythm comes in here.
3. Anticipatory Learning.
   The learner "hears himself repeat" the material, while he turns his glance from the almost committed pages.
4. The doubtful places are fixed.
   Each stage has a different "feeling attitude." The muscular tension and unpleasantness observed during the first reading later gives place to pleasantness.

IV. The next weightiest aid in learning is smooth, easily understood and read *sentence construction,* as little

as possible complicated by dependent clauses or by adverbial constructions and dependents. Rhythm is next in importance.

V. The reading tempo is very important. The one most agreeable to the observer should be determined and employed.

VI. Striking words, both in English and in a foreign language are a great aid in learning. Imprinting is aided by alliteration and assonance of given words; by visual or auditory helps; by outer localization. The concreteness of the material is an effective aid. Errors once made greatly impede correct apprehension and reproduction.

Like Meumann (*Oekonomie und Technik des Gedächtnisses,* 1908) Kraemer finds different kinds of memories:— 1, the easy or difficult in acquiring; 2, the easy or difficult in reproducing; 3, the true or accurate; 4, the large in span; 5, the lasting or tenacious.

The author makes the following pedagogical applications:

(a) For all learning by heart, a clear notion of the content is most important for adults and school children. The facts understood, the words will imprint themselves afterward.

(b) Next, the sentence construction should be analyzed and made clear, and all unusual words (or foreign ones) explained.

(c) The localizing memory should be encouraged as much as possible, and the auditory-visual helps taken into account. Adults very often read a text incorrectly, and then reproduce it in the same way. So with school children. A false first impression causes great waste of time and energy and *may* never be corrected. This is the *menace* or even "punishment" of *inattention.*

Meumann has added a ten-page appendix to this article of Kraemer's. It is evident that he considers it of great importance for the psychology of learning and desires to drive home its conclusions. He discusses at some length the difficulties in using meaningful material in such experiments, but concludes that such material when properly used will bring us much nearer to a formation and correct application of the laws of learning.

Weber (40) investigated the relation between accumulated repetitions of material and repetitions just sufficient for a one time recall. His results support Meumann's conclusion that retention is in direct relation to the number of repetitions,—

other things being equal. Six adults served as observers in Weber's experiment. One was the professor himself and five others were University students. The object of the experiment was not known to the observers; the time chosen for work was from eight to eleven-thirty in the morning. The material used was the Müller-Schumann nonsense syllables. The experimenter investigated: (1) the differences in retention (after learning for a first imprinting and with accumulated repetitions) of ten, fourteen, and twenty syllable series learned and re-learned twenty-four hours later; (2) the course of the retention of inverted series after imprinting with accumulated repetitions and after a learning for a first errorless reproduction; (3) the associative binding of syllables together. The *Treffer-methode* was employed throughout. Weber's articles contains a great many tables showing his results in detail. His conclusions are:

I. The absolute amount retained is greatly increased by accumulated repetitions over that retained after a learning for a first time recitation. Further repetitions of material already learned strengthen and fasten its retention. The pedagogical application here is plain.

II. The stronger the single elements of an inverted series are bound up with one another, the greater interference these associations make for the learning of the inverted series. The less the associative relationship, just so much quicker will the series be learned, and the greater the sparing over the learning of the original series.

III. The associative connection between single elements of the learning material is not measurable in the immediate result of the members retained in the mind at the time of the test but is subject to greater individual variation.

IV. In learning, a greater quantity shows itself more favorable always *up to the fatigue of the mental energy*. It proves economical to separate big tasks into smaller ones, recognized as parts of a whole, but which can be learned without exhaustion.

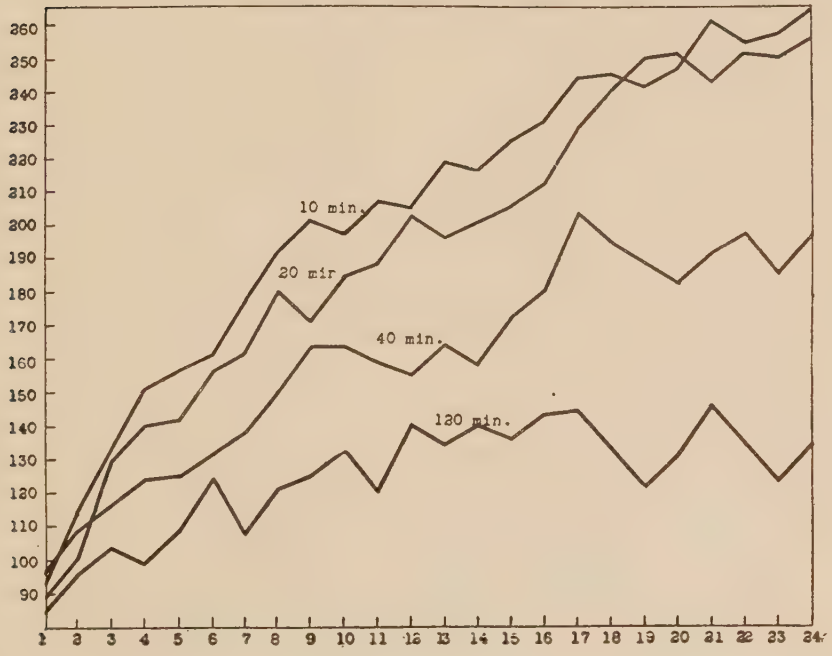
V. All memory improves with practice. Rhythm is an aid. Outer distractions have greater influence on the reproductions than on the learning of material.

This experiment would be more interesting if the re-learnings had taken place at longer intervals than the twenty-four-hour periods employed.

D. *Periods of Work.*—Starch (37) was interested in "the effect which distribution and length of periods of work have upon the rate of learning." He notes that "Ebbinghaus found that in learning a series of twelve syllables, 68 repetitions made in immediate succession were not as advantageous for later relearning as 38 repetitions distributed over three days. Jost, also working with syllables, found that two repetitions a day for twelve days were better than four repetitions a day for six days, and the latter were better than eight repetitions a day for three days."

Starch proposed to determine whether this held for other materials and for longer periods than Ebbinghaus or Jost had used. He associated a number with each letter of the alphabet, and gave each observer six blanks containing a key of letters and numbers at the top, and lines of connected prose on the left hand margin. The subjects were to transcribe each line, putting the appropriate number in place of each letter.

Forty-two students took part. They were divided into four groups, one of which worked ten minutes at a time, twice a day for six days; the second group worked twenty minutes at a time once a day for six days; the third worked forty minutes



at a time every *other* day for six days; the fourth did the entire task at one sitting.

Each person was instructed to make a check-mark at the end of every five-minute period of work. The results show an enormous advantage of the shorter, more widely distributed periods, as indicated by the curves above.

This result opens an exceedingly interesting question. How shall we explain the advantageous effect of wide *distribution* of a given learning time? We seem here to have an excellent example of the "working over" of material by processes not in the focus of consciousness, a phenomenon admirably discussed by Burnham, in an article entitled Retroactive Amnesia, published in the *American Journal of Psychology,* July-Oct., 1903, Vol. 14, pp. 118-132.

Nagel (26) discusses the findings of the most noted experimenters in the field of learning, especially Ebbinghaus, Müller, and Schumann. He also describes several experiments of his own, using two and three adult observers, in which he investigated the relative value of different repetitions (the first, second, etc.), both for nonsense and meaningful material; the influence of pauses after a reading of the series to be learned, and the influence on retention of position in the series. His conclusions corroborate the findings of the other investigators in these fields.

E. *Effect of Trial Recalls.* (*Recitations.*)—Witasek (44) made one of the first thorough-going attempts to formulate the effect which trial recall has on learning. He displayed series of ten nonsense syllables on a Wirth exposure apparatus, and had the material learned by twelve different combinations of readings and recitations. His observers read the syllable aloud in trochaic rhythm, and attempted to keep the same rhythm and tempo in the "recitation" series. If the observer broke down in his recall, the experimenter prompted him. A record was kept of the time consumed in the recitations and the errors made.

Witasek concludes:

I. That recitations are far superior to readings in learning value.

II. Of the recitation groups following one another, the first has the greatest learning value, and each succeeding one less.

III. Of readings following one another, the first has the greatest learning value and each succeeding one less.

IV. The learning value of recitation is greater if the associations by which it is strengthened are made through reading and recitation, not through readings alone.

A more pretentious and more convincing investigation was made by Katzaroff (15), though he, too, employed only adults, and so is open to attack on the score of too narrow an outlook on a question of such weight for pedagogy.

Katzaroff notes that in learning, we instinctively employ two different proceedings: *i.e.* (1) we turn our eyes over and over the material; (2) and we try to recite it to ourselves. He sets himself to solve three questions:

(a) Has recitation, *per se,* a specific value in fixing material? (b) If so, what is its importance in comparison to the mere reading of the material? (c) What is the nature of this fixative value and by what mechanism does it work?

Five different combinations of reading (L) and recitation (R) were employed:

Combination A $\left\{\begin{matrix} L_{10}–R_1–L_5 \\ L_{10}–R_1–R_5 \end{matrix}\right\}$ test made 48 hrs. after learning.

Combination B $\left\{\begin{matrix} L_8–L_7 \\ L_8–R_7 \end{matrix}\right\}$ test made 72 hrs. after learning.

Combination C $\left\{\begin{matrix} L_8–L_7 \\ L_8–R_1–L_6 \end{matrix}\right\}$ test made 72 hrs. after learning.

Combination D $\left\{\begin{matrix} L_4–L_6 \\ L_4–R_6 \\ L_4–R_1–L_1–R_1–L_1–R_1–L_1 \end{matrix}\right\}$ 24 hrs.

Combination E $\left\{\begin{matrix} L_4–L_6 \\ L_4–R_3–R_3 \\ L_4–R_2–L_1–R_1–L_1–R_1–L_1 \end{matrix}\right\}$ 24 hrs.

After the initial readings (10, 8, or 4, according to the series) 2 minutes elapsed before the next reading, or recitation. In the recitations, the experimenter supplied the associated syllable in case the observer had forgotten it. Twenty seconds were allowed the subject before his performance was called a "miss."

Combination A. was only tried on Claperède, and the results were useless because he found so many associations with the syllables in the series used.

Combination B, was employed by 3 observers, tested after 72 hrs. It was found that 8% of series L. was remembered, 23% of series R. was remembered.

Combination C. was employed by 2 observers, tested after 72 hrs. It was found that 11% of series L. was remembered, 17% of series R. was remembered.

Combination D. was employed by 1 observer, tested after 24 hrs. It was found that 80% of series L. was remembered, 26% of series R.′ was remembered, 10% of series R.″ was remembered.

Combination E., tested after 24 hrs. It was found that 100% of series L. was remembered, 35% of series R.‴ was remembered, 24% of series R.″ was remembered.

The material used for this experiment was nonsense syllables constructed after the Müller-Schumann laws, exposed in pairs (eight pairs in a series) on a revolving drum, for two seconds each, and read aloud in trochaic rhythm by the observer. The test of the learning was made by the *Treffermethode,* timed by the Münsterberg chronoscope, and introspective data taken with regard to the certainty of the memory and any associations which accompanied it.

Six observers took part in this experiment,—students and instructors in the University. All, except Dr. Claparède, were given preliminary tests. The object of the experiment was unknown to the observers. Part of the observers learned sixteen different series; part nine different series. The sittings always took place at the same time, for each subject.

Katzaroff's conclusions are:

I. Recitation (after a certain number of initial readings) *always* has a fixing value superior to ordinary reading.

II. The amount of this superiority varies according to the number and placing of these recitations in relation to the readings. At least two recitations should follow the initial readings, for the best economy,—one to show the observer where his weakness lies, and one (or several) for memorization itself. Then at least two readings seem advantageous to reinforce the orderly envisagement of the series.

III. The advantage of recitation is chiefly a difference in the affective state set up. Liking for some associates, antipathy to others enrich the mental content and increase attention. Physiologically, the nervous discharges set up by recitation are the same as those used later when the test is made.

The best of this group of experiments is one made by Knors (16) in 1910—where both a group of adults and one of school boys took part, and where a variety of material was employed.

Knors attempted to find out:

1. What effect recitation had after each single reading, where the test was made by voluntary recall.
2. What effect each single reading had, when the *Treffer-methode* was used.
3. The difference between the effect of each of the above series and learning by the "whole method," as usually employed.

Nonsense syllables, two syllable concrete nouns and three-place numbers, were presented on a kymograph, whose rate was suited to the special learning tempo of each observer discovered by trial experiments. (Auditory observers found a faster tempo more effective than did visual.) The series was always read aloud, and the recitation which followed each presentation was given aloud. Trochaic rhythm was employed in reading the series in the "*Treffer*" experiment.

Meumann served as an observer in each series, in order to perfect the method. His results were not included, because variations were made often before other observers took the series. Three University students and five school boys, 11, 12, and 13 years of age served as subjects. The adults were all familiar with this sort of experiment and extremely interested in it. Care was taken to keep up the interest of the boys. The adults worked in the experiment from 9-12 A. M., the boys, from 3-5 P. M. Each observer was given a practice experiment, with different material. The adults had series of 14 and 18 nonsense syllables; 12 and 18 words; and 12 three-place numbers. The children had series of 8, 10, and 14 nonsense syllables; 10 and 14 words; series of 12 three-place numbers.

Tables and curves made from averages of five or six experiments in each series for every observer show the results of this experiment. The curves for the adults rise more abruptly than do those for the children, showing, according to Knors, a greater ability which adults have in controlling the attention. The boys needed a greater number of repetitions for a first-time perfect recitation than did the adults. The series of 14 nonsense syllables and of 12 three-place numbers were given to adults and children alike; the results, therefore, are comparable.

A second experiment was also made testing the influence of recitations on learning with the *Treffer-methode*.

The results show:—

(1) This method (*Treffer*) is harder for adults than the first *Aufsage* but easier for children. (2) The learning effect of a first repetition is not nearly so great as in the first method.

A characteristic sudden rise in the curve occurs around the sixth and seventh repetitions for the adults; a characteristic sudden rise in the curve occurs around the fourth and fifth repetitions for the children.

A third experiment, or the "whole method," employing nonsense syllables, 2 syllable words, and three-place numbers was made. Both adults and children had 6 series of 12 three-place numbers.

The results, comparing all three experiments, are:—

1. Observer A gave best results (for all material) on 1st method. (*Aufsage.*)

2. Observer B gave best results (for nonsense) on 3rd method (whole method).

Observer B gave best results (for words and nonsense syllables) on 1st method.

3. Observer C gave best results Same as B.

The boys gave best results (for words and numbers) on 1st method.

Both the *Treffer* and the *Aufsage* methods prove better than the "whole method" for children in nonsense material.

The general result of this group of experiments is unequivocal. Attempted recall is very advantageous to learning, of the kind here employed. An interesting field is open to the investigator who will extend the comparison of the recall and the "whole" methods to other materials.

II. TRANSFER

A very excellent study in the field of "transfer" has recently been made by an English investigator, Sleight (36). No experiment, so far, on the subject of transfer has been so carefully planned, exactly executed, and fairly evaluated.

Sleight states his problem thus:

"Is the power to memorize (after being increased by practice in one particular material and by one particular method) transferable to another material?"

Ebert and Meumann, Coover and Angel, Judd, Winch, and Fracker conclude that some *general* power is developed. Woodworth, Thorndike, and Sleight believe that their results show the contrary.

Sleight made two experiments, one with public school children, and one with students in a woman's training college.

The children were from three classes in three different schools. Their ages ranged from eleven to twelve. Each child was given immediate memory tests, with ten different materials,—both meaningless and significant,—and on the basis of these tests, each class was separated into four groups

of equal average ability. Group 1 in each class (of the three different schools) was practised in memorizing poetry; group 2, in learning tables in arithmetic; group 3, in mastering the content of prose passages read to them; group 4 was not practiced at all.

The practices lasted one-half hour, and occurred four times a week for three weeks. At the end of that time, ten memory tests similar to the first were given to all the classes again. Then an exactly similar practice period was given, and a third test made at the end of the second three-week period.

A new feature of the experiment was a cyclic arrangement of the three test series so they could be considered equal in difficulty.

School I took the three tests in the order A B C, school II in the order B C A, school III in the order C A B.

The average result, then for the three schools would be; $\frac{A\ B\ C}{3}$ for the 1st series, $\frac{B\ C\ A}{3}$ for the 2nd, and $\frac{C\ A\ B}{3}$ for the 3rd. Therefore, only *practice* could affect the result.

The method of calculating the results was equally careful.

I. The numbers of correct items was used in every case and the numbers obtained in second, third, and fourth tests were compared with those of the first. II. For comparison, the number of items of the non-practiced children was subtracted from that gained by the practiced, and the result divided by the standard deviation. III. The probable error was obtained, and it indicates which of the values are significant.

Results:—

1. No general improvement of practice is found either for the children or for the 18 and 19 year old students.

2. In one case, the memory for nonsense syllables was considerably improved, where the training had consisted in memorizing poetry and tables. Evidently the common factor of rhythm was the cause. *No* improvement was found in the memory for nonsense syllables when prose was practiced.

3. The practice of prose substance (content) effected an improvement in that subject, *but in no other.* It even seems to have given a poorer result in one case, i.e., nonsense syllables.

Sleight's article contains an excellent critique of the other experiments in field.

The question cannot be considered settled yet. Sleight's results are negative and it would seem, that when we are concerned with a phenomenon so complex and so important for scientific pedagogy, many careful investigations extending over long periods should con-

firm a final conclusion. A great part of our education, as well as of our literature, conversation, and daily thinking, assumes transfer as a fact. Yet the experiments of the most ardent advocates of the doctrine, Winch, Fracker, Coover and Angell, and Meumann have grave faults which quite justify throwing out their results. Thoroughgoing advocates of transfer contend that its opponents impinge the unity of mind and are, logically, contending for "water-tight compartments of mental functioning." Whether or not this can be maintained is open to question, meanwhile here is an excellent problem for an investigator willing to spend years in order to make a real contribution.

We go back to the year 1905 for an experimental study which appeared just too late to be included in Meyerhardt's bibliography. This is an investigation reported by Wessely (41) who was interested in the value of memory drill *as such* for school children. Wessely notes that in the higher schools the memorial work in the course has one of three different ends in view: first, the acquisition of material necessary for further knowledge in a science or any given study or activity, e.g., vocabularies, grammatical rules of a foreign tongue, mathematical formula, historical facts, names, dates, etc.; second, the acquisition of material useful as a permanent possession on account of its beauty or moral value, e.g., poetry, religious material, etc.; and third, learning for formal practice only. The first is, in his opinion, of undoubted use. To test the practical value of the second, Wessely had the scholars in grades V-OII (children probably averaging from 10-16 years of age), write out what they had learned (of certain poetical or religious material) for the year past. If a pupil came to a stop at any place but recalled the material later, he was instructed to insert it in his account. The recall was limited to one sitting. The students were told that the outcome would make no difference in their standing and asked not to talk aloud nor look about. The classes contained from twenty-three to thirty-four pupils each, and the poems which these pupils had been expected to learn during the last year included: For Gr. V, *Des deutschen Knabens Tischgebet;* Gr. IV, Fontane's *Ziethen;* UIII, *Der Ring des Polykrates;* Gr. OIII, *Der Graf von Habsburg;* Gr. UII, *Erlkönig;* Gr. OII, The second monolog of the *Jungfrau von Orleans.* These were made the subjects for the test.

An exact comparison of the results is, of course, impossible. Wessely's general conclusion is: The average memory performance increases noticably from V to OIII, and falls back in UII to the level of IV, and in OII even sinks a little

under that of V. Wessely acknowledges that many factors which may influence such results as, e.g., the unequal difficulty of material, occasional misunderstandings between teacher and pupil, and the absolute and relative importance of like intervals for different pupils, are present in this experiment. But this question is pertinent: If the performances of UII are so distinctly lessened is so much to be expected from the training of memory as is generally assumed in school practice?

In order to answer this question Wessely subjected the classes VI, IV, OIII, and OII, all of them separated by a two years' course from each other, to a test in learning and retaining Latin vocabulary. The pupils were tested immediately after the learning, then again the next day, further a week later, and again after four weeks. His results show that from the end of the first to the end of the fourth week, Class VI forgot relatively the least and Class OIII relatively the most. There was a clear progression in accomplishment from VI to IV; then a certain decline to OIII; finally a standstill with a little progress again at OII. As, in the memory for poetry, there appeared first a rise, then a fall in the retention, only that in the case of the Latin vocabulary the higher point was clearly reached at Class IV. It seems very evident that although an increasing number of Latin, French, and later Greek words are learned by the pupils in schools, still the memorial capacity of those pupils is not increased—even retrogrades in many cases. Wessely cries out against the tragedy of so much enforced memorization of material doomed to quick oblivion. "It is with good ground," he says, "that the French speak of 'apprendre par coeur' and the English of 'learning by heart!'" He finds the same waste in the enforced learning of catechisms and other religious material which he thinks is nearly always obscure in meaning, and so useless as a moral guide.

He believes the results of his investigation justify him in demanding of the schools more independent work, freer development of the native endowments and interests of the children, more knowledge of life, and fewer dead facts.

III. Conclusions and Pedagogical Applications

What new facts, if any, have been added to our knowledge of the memorial function or its economic employment?

1. There seems good reason to conclude that a learning method which will incorporate trial recitations is more advantageous than the "whole" method, or the "mediating" method as usually employed.

2. The question of what sense department or departments are best to appeal to in presenting material to be learned, seems to have been reopened, and some good evidence (Henmon, von Sybel, Pöhlmann) emphasizes the value of auditory presentation, once discredited; while the visual-auditory-motor presentation, formerly favored very generally, is considered disadvantageous by several investigators.

3. Transfer appears more adequately challenged than ever before. Other results tend rather to confirm and definitize the conclusions already reached, e.g.:

(1) Meaningful content is the greatest aid to learning.
(2) Shorter learning periods, distributed over a greater length of time, exceed long periods in memorial result.
(3) Forgetting proceeds more rapidly immediately after learning than later on.
(4) Children require more repetitions than do adults for memorizing the same amount of material. Also, their memory span is less.
(5) The tempo of presentation should be increased as learning proceeds.

Book (4) has published an excellent little article on the rôle of the teacher in economic learning. He emphasizes the need that instructors be acquainted with all the known facts of learning, in order to foresee his pupils' difficulties and lessen them.

A teacher who knows that the young child's memory span does not exceed four or five words, will not put long questions to him, or set down failure to apprehend a long order to inattention.

A teacher who knows the laws of forgetting will see to it that frequent reviews are given, and that they occur as soon as possible after the acquiring of the material.

A teacher who understands the nature of ideational types, and the weighty part they play in apprehension and retention will endeavor to accommodate material to the individual types at hand as far as possible.

Meumann tells a story of a boy who was considered dull and obstinate because he repeatedly failed to draw a map of Greece. He appeared to study it, and yet made an unbelievable failure in an attempt to put it on the blackboard. Meumann tried having him trace the outline with his finger. The result was a marvel of improvement. Such a child should, of course, be encouraged to use all the motor aids available.

The question whether or not an individual should stick to his own predominant type of imagery is still open. Meumann,

Pöhlmann, and others who stand for general training answer the question in the affirmative.

Above all, the teacher who knows and utilizes the results of psychological investigation will endeavor to spur the attention by creating interest, and keeping the affective toning well on the side of pleasure. He will not allow time and energy and joy of success to waste away on a plateau, when a good climb only awaits the proper stimulus.

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BOOK NOTES

The Montessori Method: scientific pedagogy as applied to child education in the "Children's Houses," with additions and revisions by the author. Dr. Maria Montessori. Translated from the Italian by Anne E. George, with an introduction by Professor Henry W. Holmes. of Harvard University. Frederick A. Stokes Co., New York, 1912. 377 p., with 32 illustrations from photographs.

The appearance of the translation of Dr. Montessori's "Il Metodo della Pedagogia Scientifica" has been awaited with almost unprecedented interest. While the work was already familiar, in the Italian, to a small body of those engaged in educational work, the interest of the general public has been aroused to an unwonted degree by a series of popular magazine articles. This has been to some degree unfortunate, for exaggerated statements of the wonder working properties of a set of didactic apparatus have tended to obscure the real value of the system.

To a whole-hearted enthusiasm for her work, Dr. Montessori has added a most thorough scientific preparation in psychology and experimental pedagogy and unusual experience as a teacher. Convinced by her study of Seguin's method and by her own success in its application to feeble-minded children of its great educational value, Dr. Montessori conceived the idea of applying the same principles to the education of normal children and so far as the system of sense training is concerned, it is the Seguin method. But the normal child reacts in quite a different way from the mental defective. The deficient child needs constant urging to effort; if he makes an error, he must be shown how to correct it or have it corrected for him, whereas interest in the normal child is spontaneous and the didactic material enables him to correct his own errors. But the sense training is only a part of Dr. Montessori's system. In the first "Houses of Childhood" established, the children of the tenements were cared for during the entire day, and the daily program includes many practical exercises. The children are taught to wash their hands and faces, and even to take a partial bath, to put on their own pinafores and other garments, to put away all articles used in their school exercises and play, and to observe and supply any omissions in the proper care of school room and utensils. Outdoor work in the care of plants and animals, systematic physical training by gymnastic exercises, both with and without apparatus, clay modelling, free play and games, some of them kindergarten games, all form a part of the day's program.

As a result, children from three to five years old learn to read, write and perform simple arithmetical operations with ease and pleasure. There is no forcing, and perhaps no two children develop in the same way. Reading and writing occur as a spontaneous development; poise and accuracy of movement are developed to a remarkable degree, and together with the utmost freedom, there is prompt, cheerful obedience and a charming lack of self-consciousness.

The fundamental principles which distinguish Dr. Montessori's method are complete liberty of the child in its spontaneous manifestations and the utilization of every particle of its natural energy. No child, she thinks, can be called disciplined unless he is master of him-

self. Mere yielding to the will of another is not discipline. Perhaps the finest chapter in the book is the one entitled "General Review of Discipline," in which Dr. Montessori describes the steps by which the child's will is trained so that he becomes obedient through self-discipline, of which the first dawning comes through real work.

In considering the possibility of the application of this system to American children, the fact that its first schools were a part of a scheme for social betterment must not be forgotten. It would be unfair to compare with our public kindergartens which have their pupils only for a few hours, an all-day system which combines an ideal day nursery with the school work. Moreover, although we too have tenement houses and neglected children for whom such a combination would be most desirable, such coöperation as is given by the Italian parents is scarcely to be expected. Certain pedagogical developments, such as the spontaneous reading and writing, are not likely to occur in a non-phonetic language like English. When the Italian child has once mastered the sounds and forms of the letters of the alphabet, he possesses potentially the power to write with a vocabulary equal to his spoken one. He has a new means of communication with all the charm of a secret language. The American child, however, who, under like conditions, wishes to express his joy in new achievement by saying "I can write" is confronted with a decision between rite, right, rit or write. It is not probable that even the reformed spelling board will be able to solve this phonetic problem, but the method of utilizing three senses instead of one and the emphasis upon the motor element in teaching writing remains an admirable one, and apparently produces better results than any system now in vogue in the United States. Probably American teachers will not wish to dispense with the word method of teaching reading, which is better adapted to our language than a phonetic one, but is it not possible that the Montessori principles can be applied to this method to render it even more effective than it now is? The question has often been asked, how does Dr. Montessori's method differ from our best kindergartens. Undoubtedly there is considerable in common, for every educational system that is worth while is due to gradual growth, and what is of permanent value in the old is incorporated in the new. And yet there are important points of difference.

Froebel believed that the child should be constantly directed in work and play. Dr. Montessori would not direct the child from without, but would simply remove all obstacles and let him develop himself, attaining perfection through self-correction. It is true that a certain liberty of choice on the part of the child is allowed in the kindergarten, but the teacher, nevertheless, directs the program, while in the Montessori school every child is doing what he most wants to do and often no two children are doing the same thing.

Another point of difference lies in the distribution of time. In the kindergarten the period allotted to each occupation is short, and all the children do the same thing at the same time. In the Montessori school, if a child wishes to spend the entire two hours of the school period in doing one thing, he is allowed to do so on the ground that he is thus training his attention and he often does it.

Another point not originally emphasized in kindergarten training, although its importance is now recognized by our more progressive kindergartners, is the muscle and touch training upon which so much stress is laid in the Montessori system.

The systematic physical development of the child by carefully devised apparatus and free gymnastics is also not a part of the kindergarten system and results seem to justify Dr. Montessori's theory that the

period between three and six is the most important age for physical development. The kindergarten gifts are few in number and are based on a philosophical theory. Dr. Montessori uses a multiplicity of didactic material that appeals to the children in many different ways and which has been devised as the result of years of practical experiment.

And last but of the greatest importance is the difference in the training of the Montessori teacher, who is transformed into a scientific observer, who must know how to repress what is undesirable and refrain from interference in what is developmental yet at the same time supply the fitting environment as the child progresses.

In spite of these differences, there is much in the Montessori system which will certainly be welcomed by progressive kindergarteners. Some of its methods have indeed already been developed by them, and could the creative genius of Froebel have had the broad scientific training which has helped Dr. Montessori to place her system on a sound psychological basis, the differences between them would probably have been far less than they now appear. THEODATE L. SMITH

All the Children of all the People, by W. H. SMITH. New York, Macmillan, 1912. 346 p., $1.50 net.

Here the author of the *Evolution of Dodd* gives a popular summary of our attempt to educate everybody which is admirable for its sound common sense and its putting of fundamental facts in so concrete a form that the general public can easily follow him. His general standpoint is that every individual is born short in some respects and long in others, that education cannot change these inborn traits, and that it is foolish waste to try. They probably go back to fundamental conditions of bodily structure which limit or entirely determine mental functioning, and can be changed only in so far as we can alter the bodily state. This, of course, we can do in numerous cases, and hence the importance of school physicians, hygiene, etc. Still it remains true that all men are not equal in the sense of being alike nor is the child's mind a *tabula rasa* as we should so like to have it, and since these two assumptions of the founders of our public school system are false, the system itself must have certain fundamental faults. Again our system took present shape just after our Civil War, and its organization is essentially military and compulsory. It demands uniform and symmetrical results of all children, and assumes that all are preparing for the classical college course. The result is that most children drop out as soon as the law allows. We can only remedy this by studying individuals and by acting on the assumption that any man is educated who is "onto his job," even if he cannot so much as read. The teacher must first of all find what each child vibrates to sympathetically and develop him along that line. There should be no hard and fast courses but great variety so that all the children of all the people shall find all they need. Thus industrial training, domestic science, and so on will come far more to the front than now and the classics and pure mathematics will retire. Ability to do will be more valued than ability to remember and examinations will decrease or disappear. Vocational guidance *before* the child gets ready to leave school will enable us to shoot to hit, and we shall not waste our time nor the children's by trying to pound square pegs into round holes. There is a good chapter on what reading is, and another on the sort of morality and religion that our schools need.

The situation in our country at present is summed up to this effect: "Babel was a decorous afternoon tea party compared with the polyglot clamors that are coming up all over this land from voices that are as diverse as the races of the earth and whose shoutings are as varied as

their self-interests are multitudinous. . . . And back of all this is . . . a new situation brought about by an era of scientific thinking, which has hardly yet reached its years of discretion. There is much of the bull-in-the-china-shop in the use of this new acquirement by the rank and file. . . . But the proletariat can no longer be hushed by an edict from the aristocracy," and our only salvation is to establish righteousness and justice in the hearts of the people, which can be done only if our public schools can be made equal to meeting these demands.

AMY E. TANNER

Caillou et Tili, par PIERRE MILLE. Paris. 269 p.

This is a set of delightful sketches from the life of a boy between five and seven years. His older sister, Tili enters into some of them, but incidentally. It describes Caillou's anguish on realizing that he wore his sister's made-over clothes. He does not eat nor play, nor could the doctor cure him. At length, as one man to another, he discloses to the author the worm at his heart: How could he know whether he was a boy or a girl when he wore his sister's clothes? When properly dressed and thus secure in his sex, he speedily takes the masculine standpoint of contempt and indifference to girls. They weary him, and if he is alone with several of them they play tricks on him—which a crowd of boys never does to a little girl. But if there are only two of them, then they are jealous of each other, while he is indifferent to all their showing off and unconscious of it. But yet he is not really unconscious of sex, for he kisses and embraces his mother very differently from his father, and has already fallen in love with a young lady—a lady who could climb like a mountain goat and who had two beautiful locks of hair down her back. When she took his flowers he was happy, but when, on going away, she picked some for him, he could not even be sorry she had gone. When he is five and Tili eight, he becomes conscious of a difference between them, but Tili does not, and so they are given different rooms and told that now they are big they must knock, and must not see each other in their chemises. Tili understands this literally, and when his knock at her door the next day finds her *en chemise,* she quickly drops it off and goes to the door naked, greatly to Caillou's embarrassment, while she is still as unconscious as a baby.

Caillou's imagination is vivid, as is shown by his experiences in the country, but still more by his disappointment over the circus, which is not nearly as fine as he imagined it. But, too, he is a little gourmand, and naïve to the last degree. When his Uncle says he will give him a horse's egg to be hatched, and gives him a big pumpkin to be kept warm till it is ripe, Caillou explains to himself that the rabbit which emerges one morning came because he had not kept it warm enough to hatch a colt. Again, he respects property rights, but primarily because he has things of his own, and he understands what sous are and how to make a bargain. He has all the feelings and sensations of adults in his small body, and so he feels himself powerful, and is boastful at times, while over the dark he develops a fear which he cannot justify, and he formulates the primitive religious idea that the death of his pet canary is the punishment for all his undiscovered sins. On a visit to the country, he cultivates acquaintance with the ants to the end that he may persuade them to torment his enemy the cook, he takes them food to propitiate them, etc., and not only asks them himself but gives the dog the same message to them. Again, at one meal horse steak is put on the table, which he eats greedily, believing that thus he will gain speed. Like primitive man again, the clay model of him is really himself, and when the artist, dissatisfied with the head, cuts it off, he screams with horror. Even feeling that his own head is really

there still is not enough. "The other—that is me, too, and you cut it off!"

But when Caillou reaches the age of seven, he has reached the troublesome age, and here the author leaves him, playing tricks on his uncle and worrying his mother until she plans to send him away to school, where M. Mille prophesies that he will be educated to death like the duck that thus died from not knowing how to swim.

AMY E. TANNER

We and Our Children, by WOODS HUTCHINSON. New York, Doubleday, Page and Co., 1911. 371 p.

A popular discussion of how to keep children healthy. The author is so fond of making striking statements that sometimes he sacrifices accuracy—or possibly he thinks that to combat excesses in one direction it is necessary to go to the opposite extreme. Possibly most children are half starved for sugar and fats, and possibly the stomach is intended to be actively digesting all day long and night too, as the author seems to think, but one is inclined to scatter question marks along those sections. One wonders, too, of just how much value is his hearty commendation of the dime novel and his equally violent criticism of myths and heroic tales. There is a trifle of the spread eagle style in his praise of the American mother and one feels that he underestimates the part played by heredity in insanity, feeble-mindedness and kindred weaknesses. Surely a man assumes a grave responsibility who lightly assures his readers that half the offspring of the drunkard and epileptic may grow up normal unless he marries one of his own kind, the implication undoubtedly being that the drunkard and epileptic do no harm by marrying. Such an irresponsible point of view on the part of a physician and writer deserves only condemnation. Again he states that the "few hereditary diseases" like epilepsy, certain forms of insanity and possibly alcoholism, can, eight times out of ten, be trained and fed into normal vigor. One would like to know what authority he has for any such statement. Psychiatrists certainly take no such position.

In spite of the author's inaccuracy and unsuitable flippancy, however, one must state that he puts things in very readable fashion, and that the sections on the care and feeding of the baby and the general physical regimen of the child will doubtless instruct many mothers to their advantage and the child's.

AMY E. TANNER

The individualization of punishment, by RAYMOND SALEILLES. Tr. from the second French edition by R. S. Jastrow. Boston, Little, 1911. 322 p.

This volume is fourth in the Modern Criminal Science Series and is certainly one of the best that has yet appeared in that series. The author starts with three types of individualization of punishment. The first is legal, where the law provides how motives and circumstances, etc., should affect the nature or severity of the punishment. This in general the author thinks has only limited range because the law cannot possibly provide for all varieties of individual differences and motivation. Another method would be judicial individualization where the judge adjusts the punishment as he deems best for the safety of society and the reform of the individual and is given much latitude to do so by the law. This is judicial individualization. The third form is administrative where, as in the new California code, discretion in determining the nature of the punishment is left with the jury. From this interesting book it is apparent that all the progressive nations of

the world are waking up to the fact that the old method of the same penalty for the same act, no matter how different the motives or character, is barbaric and that awakening of itself opens up new and interesting vistas of possibility of better things.

Life, love and light; practical morality for men and women, by Z. London, Macmillan & Co., Ltd., 1911. 177 p.

The writer of this book, although we are not told who he is, assures us that he is neither a parson nor a professor, that his other literary ventures have been concerned with widely different subjects and that nothing could be more distasteful to him than to pose in his own person as a teacher of morals. The idea of the book dates back thirty years, the time when the author "was preparing for that finest of all examinations, the old (unspecialized) school of Literae Humaniores at Oxford." He has not endeavored to write a learned work or discuss current ideas and so he treats besides the subjects that appear in the title, poetry or pigeon holes, blind alleys, temperance, chastity, justice, relations of ethics to religion.

Association educational work for men and boys, by GEORGE B. HODGE. Association Press, New York, 1912. 256 p.

This work is to take the place of a former one by the author written in 1902 and entitled "Educational Work for Men," and it represents twenty growing years of association experience among all kinds of men and boys. He discusses the history, principles, policy general features, classroom demonstration, supervision, different groups, boys, vocation training and miscellaneous. The work abounds in interesting pictures and remarks.

The boy and his gang, by J. ADAMS PUFFER. Boston, Houghton, Mifflin & Co., 1912. 188 p.

The author tells us that six boys who were members of gangs are responsible for this book. They told him the stories of gang life and he wrote them down and has worked in with them much other interesting material, so that his book ought to reach parents, teachers and social workers and is a contribution to the group psychology of boyhood. The chapters treat of the general nature of the gang, its organization, special activities, its anthropology and psychology, the control of primitive impulses, such as predatory, the Wanderlust, individual activities and group games, special virtues of the gang, how to use it in constructive social work and its relations to the school.

Problems of boy life, edited by J. H. WHITEHOUSE. London, P. S. King & Son, 1912. 342 p.

This is a collection of essays by different people on eighteen different subjects, with an introduction by the Bishop of Hereford. The topics are: the reform of elementary education; the economics of boy labour; boy labour: some studies in detail; boy labour: towards reform; boy labour and the factory system; the boy criminal; the station lounger: a study; street trading by children; the supervision of juvenile employment; Dr. Kerschensteiner's system of education in Munich; the school as a means of social betterment; children's care committees; homes for working boys; religious influences and the adolescent; cross-fertilisation in schools; the breaking down of caste; recent parliamentary and other inquiries concerned with problems of boy life; the compulsory age for school attendance in foreign countries.

Boy Scouts of America; official handbook for boys. New York, Doubleday, Page & Co., 1911. 391 p.

This is a new and enlarged edition, and with it goes an illustrated handbook by John Alexander with many colored cuts of boys' costumes and illustrations of their various activities.

What to do at recess, by GEORGE ELLSWORTH JOHNSON. Boston, Ginn & Company, 1910. 33 p.

The author evidently regards play as on the whole more important than study in the education of the child and so attempts to curriculize a number of plays and games and describes them with copious illustrations as to how to play them to get the most advantage therefrom.

Great educators of three centuries, by FRANK PIERREPONT GRAVES. New York, The Macmillan Company, 1912. 289 p.

These fourteen chapters are devoted to the following names: Milton, Bacon, Ratich, Comenius, Locke, Francke, Rousseau, Basedow, Pestalozzi, Herbart, Froebel, Bell, and Lancaster, Horace Mann and Herbert Spencer. Such a book as this is very timely and should have been written before. It should be in the hands of every student of education. Why would it not be well in later editions to bring the subject down to writers since Herbert Spencer?

Some aspects of education, by IRVING KING. New York, The Macmillan Company, 1912. 421 p.

The writer first discusses the social origin of educational agencies and then takes up social responsibility of the school, the rural situation, the social relations of home and school, the school as a center of social life in the community, need of continuation, the education of the adult, playground extension as an aspect of its larger meaning, school gardens, vocational training from a social point of view, education as a factor in social progress and reform. All these the author calls the external social relations of education and now comes the internal which deals with the general nature of social life, the spontaneities of children, social life of the school as expressed in government, the personal factor, social aspect of mental development, social atmosphere of the school, its corporate life, relation to moral teaching. The work is useful, but it strikes the reviewer as needlessly prolix. Although the writer appends various bibliographies, his reading seems to have followed certain grooves and his work is less masterly than schoolmasterly. Indeed, there is some educational literature of the highest value on this subject not in English to which this writer should be referred. The timeliness of the subject prompts a cordial welcome for such a book, but it is disappointing.

The outlines of educational psychology, by WILLIAM HENRY PYLE. Baltimore, Warwick & York, Inc., 1911. 254 p.

This work deals with body and mind, heredity and instincts, the individual, social, environmental adaptation, habit and education, moral training, memory, attention and fatigue. The book is well conceived, compact, progressive and bold, but not too bold.

Outline of a course in the philosophy of education, by JOHN ANGUS MCVANNEL. New York, The Macmillan Co., 1912. 207 p.

We have here eleven very systematic dissertations, each with four or five chapters, forty in all. They deal with the persistent problems of education, its place in human experience, its presuppositions, viz., per-

sonality and environment, philosophy of the history of education, the individual and society, institutional factors in the educational process, degrees of individual development, democracy and education, the school as a social institution, its intellectual organization. Education is an integration of religion and politics. It may take its place one day in the honorable position now held by politics. It involves all other things. The book is rather well written, but its standard formal and the topics treated rather remotely and abstractly, so that it is a hard book to read. The author attempts to be rather more philosophical than pedagogical.

Outlines of the history of education, by WILLIAM B. ASPINWALL. New York, The Macmillan Company, 1912. 195 p.

The author is Professor of History and Principles of Education in New York State Normal College, Albany, and his book is essentially a normal school book. It is a laudable attempt to place a long involved history of education and its philosophy in a compact form. This book, however, is essentially a book of skeletons and topics, with nearly all the references in English. It would be of practically no use in its present form except as a book of references for names, dates, titles, so that we can infer nothing as to the character of the course which the author might give it.

The century and the school and other educational essays, by FRANK LOUIS SOLDAN. New York, The Macmillan Co., 1912. 206 p.

These essays were selected by a group of his associates from the manuscripts of School Superintendent Soldan after his death. The topics are: the century and the school, morality and education, what is a fad, the teacher's duties, educational ideas in Dicken's novels, a visit to German schools, reading in the higher grades, folk and fairy tales.

The rise of the high school in Massachusetts, by ALEXANDER JAMES INGLIS. New York, Teachers College, 1911. 166 p. (Teachers College, Columbia University Contributions to Education, No. 45.)

The development of high schools in the United States has often been treated, but usually in a general way in connection with other national institutions or with certain prominent schools. No complete examinations of any large group of high schools for the early period has ever been made. Commissioner Harris stated that in 1860 the number of high schools in the United States was about forty, although Barney thinks there were eighty such schools as early as 1851 and the second year there were sixty-four in Massachusetts alone. Ohio is said to have had ninety-seven in 1856. This work considers Massachusetts high schools up to the beginning of the Civil War, by which time they had assumed a considerable position in the educational system of the state and the legal requirements regarding their establishment had met with a fair degree of compliance and the list of studies prescribed had assumed a rather permanent form.

High school education, edited by CHARLES HUGHES JOHNSTON. New York, Charles Scribner's Sons, 1912. 555 p.

This book is certainly very timely. The author describes the growing demands on the program, the disciplinary basis, history of secondary education since the Renaissance, principles and practices of reform, organization and instruction and control, mathematics, physics, chemistry, biology, physiography, English, public speaking, voice building,

Latin, modern languages, history, drawing, music, moral training, physiology, hygiene, sex pedagogy, agriculture, commercial education, vocational training, practical arts for girls, psychology in the high school and the high school library. The ideal of this work is admirable and the bibliography is very extensive. The articles are naturally of extremely different value. On the whole, it is a book which everyone interested in the high school problem, which is now very prominent, should consider.

The question as a measure of efficiency in instruction, by ROMIETT STEVENS. Teachers College, New York, 1912. 95 p. (Columbia University Contributions to Education, No. 48.)

This report is a study of one phase of class-room procedure, viz., the use of the question. It is critical rather than theoretical, and its purpose is to apply inquiries and suggest principles for constructive work in what the author thinks is a neglected field because so little has been written about it. The efficiency of instruction as measured by the number of questions is discussed under three heads, the nature of the investigations in class room as tested by a larger and a smaller number of questions and by their quality.

Europe; a supplementary geography, by JAMES FRANKLIN CHAMBERLAIN and ARTHUR HUNT CHAMBERLAIN. New York, The Macmillan Company, 1912. 258 p.

This book consists of twenty chapters on such topics as British Isles, France, Paris, Belgium, The Land of Canals, The German Empire, The Rhine, Denmark, some Russian cities, Spain, Portugal, Venice, Switzerland, etc. It contains 137 interesting and well chosen pictures. It is a book that cannot fail to vivify geographical instruction.

Education and statesmanship in India, 1897-1910, by H. R. JAMES. New York, Longmans, Green & Company, 1911. 143 p.

The writer modestly calls these papers slight, but they certainly must serve a useful purpose in helping people to understand from the standpoint of India what is destined to become the most critical point in colonial policy, namely, education. He traces its origins, discusses whether the adoption of English was wise, the universities and their reform, English schools, moral, religious and mass education, the higher educational service and, on the whole, he finds at the close of his review that the verdict is favorable. He admits education as more or less responsible for the embitterment of political feeling in recent years. It has probably made those influenced by it materialistic. The moral side of training in schools and colleges he thinks ought to be strengthened and personal influence of teachers attended to and the improvement of their status. The college and school ought more to be institutions. The school has not had its rightful place in a system of national education and vastly more can be done with school boys. On the whole, the work of the government and educational department, the author thinks, is vindicated.

The American government, by FREDERIC J. HASKIN. Philadelphia, J. B. Lippincott Company, 1912. 398 p.

This work, in twenty-one chapters, is devoted to as many different aspects of the government work and is designed to tell young people how they are governed.

Forgotten books of the American nursery, by ROSALIE V. HALSEY. Boston, Charles E. Goodspeed & Co., 1911. 245 p.

This interesting and quaintly illustrated book has a chapter each upon the play-book in England, Newbery's books in America, patriotic printers and the American Newbery, the child and his book at the end of the eighteenth century, American writers and English critics.

Grammar and thinking; a study in the working conceptions of syntax, by ALFRED DWIGHT SHEFFIELD. New York, G. P. Putnam's Sons, 1912. 193 p.

The author studies the scope of grammar, the sentence rudiment, the word meaning of grammatical expression, terms of syntax and parts of speech and the sentence whole. Although he cites Wundt, Paul, E. P. Morris, Oertel, he does so along with Santayana, H. B. Alexander and H. M. Kallen. His work is more grammatical than psychological, although he says that sentence study is high school philosophy, that grammar need not run into logic to become a serious discipline. To our thinking, he would have profited much by the study of recent investigations by the Würzburg thinkers.

Dancing, ancient and modern, by ETHEL L. URLIN. London, Herbart, 1912. 182 p.

The first section is devoted to primitive dances; the wave mecke, snake dance, sun dance, history of the cakewalk, Apache and Maori dances; then comes antique dancing, Egyptian, funeral, astronomic, Hebrew, Greek and Roman. The third section is medieval, sacred dancing, the origin of the Christmas Carol, dances of angels, religious dances in later times and then religious dance of Ethiopia, dance of the Seises, Dervishes, European dances, Spanish, Gypsy, Dalmatian, Basque, those of the East, Almehs, China, Japan, Hindu. In the North, the ancient Irish dances are explained, then follow military dances, revival of dancing in Europe, English country dances, the Morris and the masque, the ballet, modern dancing, and the revival of antique dancing in modern times. The book has a number of full page illustrations.

Modern dancing and dancers, by J. E. CRAWFORD FLITCH. Philadelphia, J. B. Lippincott Co., 1912. 228 p.

This elegant work which is beautifully illustrated comprises fifteen chapters on such subjects as ancient and modern attitude toward the dance, the rise of the ballet, its heyday, decline, skirt and serpentine dancing, high kickers, classical revival, Russian ballet, its repertory dancers, the English ballet, Oriental and Spanish dances, revival of the Morris dancing and the future of the dance. The writer is enthusiastic and deeply interested in his subject and his book is thoroughly readable and interesting.

Some chemical problems of to-day, by ROBERT KENNEDY DUNCAN. New York, Harper & Bros., 1911. 253 p.

This vigorous author here prints eleven essays, some on the newer theoretical discoveries concerning the nature of the atom of matter, chemical interpretation of life and the beginning of things, and others on the applications of chemistry to the arts and industries. He writes entertainingly and instructively, and this book is undoubtedly destined to attract more interest and to have a larger sale than his previous volume "The chemistry of commerce."

The coming generation, by WILLIAM BYRON FORBUSH. New York, D. Appleton & Co., 1912. 402 p. (The Social Betterment Series, edited by Shailer Matthews.)

Mr. Forbush tells us that this is "the first endeavour to furnish in a single volume a short readable account of all the forces that are working for the betterment of American young people." Thus he does not attempt to give a mere resumé of child study, although in the early part of the book he has introduced such discoveries about children as their parents and friends are likely to make. The second part is devoted to the means of giving children a fair start. The third deals with betterment through education, the fourth with the work of prevention, with delinquent and neglected children, the fifth with the matter of religious and social nurture. The summary contains a programme for united and general effort. The book is extremely readable and discusses interesting subjects such as adventures among savages, how a child thinks, books, firelight and children's faces, the garden, the years of wandering, the modern home, the art of being a Godparent, eugenics, health, the new education, vocational training and guidance, high school problems, moral training, the social schools, defective children, play and playgrounds, clubs for street boys, games and outings, the beautiful ordering of life, the child educating himself, child labor, juvenile court, reformatory methods, Sunday school, church living with its children, Y. M. C. A., the larger culture program for the betterment of boys and girls. This is a book of unique merit and should be in the hands of every friend of childhood.

Pilgrim life in the Middle Ages, by SIDNEY HEATH. London, T. Unwin Fisher, 1911. 352 p.

This fascinating book describes ancient relics, shrines, hermits, anchorites, recluses, flagellants, holy wells, pilgrim tokens and badges, itineraries, shrines of Becket, pilgrim inns, the Boxley Rood, grace, indulgences and penances and finally the reformation. It contains about forty illustrations and is charmingly written.

The English Journal. Chicago, University of Chicago Press, Vol. 1, No. 2, February, 1912.

It is high time that the English high school teachers had an organ, for their work is coming to be more and more important and they already have a number of local and other associations. The journal is to be congratulated on an excellent start,, although we cannot but wish that the department of reviews was taken a little more seriously.

Gardens and their meaning, by DORA WILLIAMS. Boston, Ginn & Co., 1911. 235 p.

The aim of this book is twofold; to show the importance of science in the use of spade and hoe and to urge that a garden for education may be not merely in substance but in spirit a corner of the great world. The writer discusses what makes a school garden worth while, little studies in coöperation, situation and soil, plotting and planning, a word for good tools, planting, the art of making things grow, just how, garden foes and friends, side shows, new light in old subjects, the young farmer's almanac, the new agriculture. The author is a gifted and very successful teacher and her book ought to be in the hands of all who are interested in the subject.

Old time tales, by KATE F. OSWELL. Ill. New York, The Macmillan Company, 1912. 245 p.

Here we have in condensed form a number of the famous folk tales, East and West. They are quoted here as if told to children. A number of ballads are interspersed. There are nine tales of Europe and the West and six of the Orient.

Around the fire: stories of beginnings, by HANFORD M. BURR. Ill. New York, Association Press, 1912. 238 p.

Although a little larger, this book is vastly superior to Oswell's. There are eighteen tales in all, the representative themes being the first potter, gang, chief, milk man, seller, artist, musician. Others are the Rang, the Redman; the garden of Ulma; Sax, the first musician; the wooing of Senna; the story of Lup; Hun, the hunter; the White man; the Lake dwellers; how man found the Great Spirit. The print is vastly too small, and this, combined with the wretched tinge of yellow in the paper, makes the book a pretty hard proposition for the eyes.

Entwicklung der Kiefer und der Zähne beim Menschen, von KARL WITZEL. Berlin, Verlag der Zentralstelle für Zahnhygiene, 1907. 65 p.

The text of this atlas is printed in three languages, German, French and English in three parallel columns. The text is descriptive of the 75 tables which illustrate the subject and which show the anatomy and development of the teeth and jaws from embryonic life onward.

Instead of "Wild Oats," by WINFIELD SCOTT HALL. With a foreword by Edward Bok. New York, Fleming H. Revell Company, 1912. 62 p.

After an introduction, the chapters are: how nature works in the boy, is a continent life healthful, what are the dangers of wild oats, the straight way safe.

The teaching of physics for purposes of general education, by C. RIBORG MANN. New York, The Macmillan Company, 1912. 304 p.

After many years of very careful study of the subject, the author of this book has given us the results of his investigations. We do not hesitate to pronounce this the most valuable treatise accessible on the subject now. He first describes the development of the present situation, the bottom purpose of the high school, the history of physics, natural philosophy, prescribed physics text-books old and new. In the second part, he takes up physics and democratic education and has something to say of its pedagogy, method, biography and discipline. In the third part, practical applications are considered, concrete problems, organization of the course, laboratory work, testing results.

Human efficiency, by HORATIO W. DRESSER. New York, G. P. Putnam's Sons, 1912. 387 p.

The author treats of the basis of efficiency, the psychological viewpoint, subconscious energies and their control, the nature of work, efficient will, success, insight, nature and scope of reason, law of love, moral efficiency.

Outlines of education courses in Manchester University. New York, Longmans, Green & Company, 1911. 189 p. (Publications of the University of Manchester, Educational Series, No. 5.)

This book is especially interesting because of an admirable and extended history of education in England from the year 1800 to 1911. It

contains other interesting articles, including a systematic review of the principles of education, another on the mental and physical life of school children, the whole being syllabi.

An introduction to experimental psychology, by CHARLES S. MYERS. New York, G. P. Putnam's Sons, 1911. 156 p. (The Cambridge Manuals of Science and Literature.)

This little primer has the following seven chapters: touch, temperature and pain; colour-vision; the Müller-Lyre illusion; experimental aesthetics; memory; mental tests and their uses, with a bibliography, an index and a few illustrations.

Elementary plant biology, by JAMES EDWARD PEABODY and ARTHUR ELLSWORTH HUNT. New York, The Macmillan Company, 1912. 207 p.

The life of Henry the Eighth, edited by CHARLES G. DUNLAP. New York, The Macmillan Co., 1912. 168 p. (The Tudor Shakspeare.)

Easy German poetry for beginners, edited with notes and vocabulary by CHESTER WILLIAM COLLMANN. Boston, Ginn & Co., 1912. 140 p.

National Education Association of the United States volume of proceedings and addresses of the forty-ninth annual meeting held at San Francisco July 8-14, 1911. Winona, Minn., Published by the Association, 1911. 1172 p.

Fifty-seventh annual report of the Massachusetts Board of Education. Boston, Wright and Potter Printing Co., 1912. 298 & CLXI p. Public Document No. 2.

Commissioner Snedden's report is a very concise document and shows the activities and the pending problems that confront the new board.

Twenty-fifth report of the Board of Trustees of the University of Illinois. For the two years ending September 30, 1910. Springfield, Ill., Illinois State Journal Co., 1911. 874 p.

Carroll Davidson Wright: a memorial, by HORACE G. WADLIN. Boston, Wright and Potter Printing Co., 1911. 48 p.

Carroll Davidson Wright: his life and work, by S. N. D. NORTH. 1912. 48 p. (An address delivered at a special meeting of the American Statistical Association, Boston, May 14, 1909. With bibliography.)

Deutsches Kunstgewerbe. Wanderausstellung des deutschen Museums für Kunst in Handel und Gewerbe haben. I. W. Unter Wirkung des Oesterreichisches Museums für Kunst und Industrie in Wien. 1912-13. 94 p.

The adventures of Grillo, or, the cricket who would be king, by ERNEST CANDÈZE. Tr. and ed. by M. Louise Baum. Ill. Boston, Ginn & Company, 1912. 225 p.

Milton's Comus, Lycidas and other poems, and Matthew Arnold's address on Milton. Edited with an introduction and notes by Samuel Edward Allen. New York, The Macmillan Company, 1912. 164 p.

Lippincott's second reader, by HOMER P. LEWIS and ELIZABETH LEWIS. Philadelphia, J. B. Lippincott, 1912. 171 p.

The criminal and the community, by JAMES DEVON. With an introductory note by A. F. Murison. New York, John Lane Company, 1912. 348 p.

Lebensformen, Ammerkungen über die Technik des gesellschaftlichen Lebens, von W. FRED. Leipzig, Georg Müller, n. d. 512 p. (Zweite Auflage.)

The educational theory and practice of T. H. Green, by ABBY PORTER LELAND. New York, Teachers College, Columbia University, 1911. 62 p. (Columbia University Contributions to Education, No. 46.)

The author treats of Green's life and writings, his ethical philosophy, social and political philosophy, aspects of his educational theory and practice, and appends a bibliography.

Scum o' the earth and other poems, by ROBERT HAVEN SCHAUFFLER. Boston, Houghton, Mifflin Company, 1912. 58 p.

The Adelaide first primer. Published by the Educational Department of South Australia, 1912. 64 p.

The masque of learning and its meanings, by PATRICK GEDDES. Edinburgh, Patrick Geddes and Colleagues, 1912. 80 p.

Report of the Committee on Backward Children Investigation. Board of Education. First School District of Pennsylvania. (December 31, 1910.) Philadelphia, Walther Printing House, 1911. 68 p.

Annual Report of National Association for the Study and Education of Exceptional Children. (Incorporated under the laws of the State of New Jersey as a society not for pecuniary profit.) New York, J. B. Lippincott Co., 1911. 42 p.

Links with the past in the plant world, by A. C. SEWARD. New York, G. P. Putnam's Sons, 1911. 142 p.

This is an interesting little handbook on such topics as the longevity of trees, geographical distribution, geological records, plant fossils, ferns, redwood, maiden hairs, etc.

Gedanken über Erziehung durch Spiel und Kunst, von V. RABIC. Leipzig, Wilhelm Engelmann, 1912. Sammlung von Abhdlgn zur psy. Pädagogik aus dem "Archiv für die gesamte Psychologie" hrsg. von E. Meumann. 11. Band, 5. Heft. S. 439-496.

The revised English grammar, by ALFRED S. WEST. Cambridge, University Press, 1912. 336 p. (A new edition of The Elements of English Grammar based upon the recommendations of the Committee on Gramatical Terminology.) (Pit Press Series.)

Thomas Carlyle on heroes, hero-worship and the heroic in history, edited by GEORGE WHERRY. Cambridge, University Press, 1911. 277 p. (English Literature for Schools.)

A first year Latin book, by JOHN THOMPSON. Cambridge, University Press, 1912. 227 p.

Cambridge geographical text books. Intermediate, by A. J. DICKS. Cambridge, University Press, 1912. 362 p.

Caesar in Britain and Belgium, by J. H. SLEEMAN. Cambridge, University Press, 1912. 123 p. (Pit Press Series.)

REPORT OF THE POLISH CHILD STUDY ASSOCIATION IN WARSAW FOR THE YEARS 1909-10 AND 1910-11

By Anna Grudzinska
Member of the Polish Child Study Association in Warsaw

During the last two years, the Warsaw Child Study Association has met each month and held conferences on the needs and projects of the society and decided to enlist in its work as many teachers and psychologists as possible, in order to prepare its members for a really scientific treatment of the study of childhood.

The following resolutions were adopted:

To print a series of syllabi dealing with topics, which ought to be studied, to be sent to the members.

To organize a series of scientific lectures to take place during 1910 and 1911. The topics presented were:

School Hygiene at the Congress at Paris, 1910. A. Szyc.
Children's Creative Powers. A. Grudzinska.
Children's Games as Survival Forms of Ancient Culture. L Kryvicki.
Babyhood in Science and Life. W. Szczavinska.
Diverse Types of Abnormal Children. J. Bradzinski.

In accordance with the decision of the administration, the society has printed many new syllabi and has sent to all its members the work of F. Jarvs. Heacher on Psychometrical Measurements at School.

It has opened a branch of the Child Study Association in Lodi, the center of manufactories in Poland.

It has chosen a series of committees for the study of the following subjects: Drawing, Abnormal children, Children's characters, Mathematics, Study of the development of language in children.

Two meetings in the autumn of 1911 were devoted to the memory of the distinguished psychologist Alfred Binet, and to the memory of the well-known poet and pedagogue, Edmund Bogdanovick, who was a member and one of the founders of the Warsaw Child Study Association.

Throughout these two years meetings of the Child Study Association have been held nearly every month to listen to the records and lectures. The topics presented were:

The Vocabularies of Children (Observations on Three Children). A. Grudzinska.
Children's Language. K. Appel.
The First Impressions of Beauty in Childhood. Z. Stankievicz.
A Method of Studying Esthetic Impressions in Children. J. Segal.
Children's Language. A. Szyc.
Observations on Children's Language. M. Heymann.
Psychological Foundations of Reading and Writing. M. Falski.
Bourdon's Studies on Children's Ideas of Space. M. Borowiecka.
Report of the Psychological Congress at Brussels. (August, 1911.) M. Stefanovika.
The Psychology of Children's Compositions. A. Szyc.
The Psychology of the Transitional Age. W. Chodecki.
Principles of a New Elementary Education. E. Lubliner.

Alfred Binet as Psychologist and Teacher. A. Szyc.

During the last year the society has printed two syllabi dealing with the development of the child's language from three to seven and seven to ten, a syllabus on Intelligence, and three syllabi have been worked out by members of the Child Study Association on Children's Creative Powers, by A. Grudzinska. Anthropology; The Colour of the Hair and Eyes of the Polish Nation in Diverse Parts of Poland, by L. Kryvicki. The Relation of Children Towards Animals, by J. Ciembronicvici.

The committee for the study of abnormal children decided not only to collect answers to its syllabi, but to gather autobiographical data; face, head, ear, measurements, to find out, if possible, a relation between physical and mental degeneration.

The committee for the study of the characters of children decided to print two syllabi, one dealing with the individual child, and one dealing with the group.

The committee for the study of children's drawings continued its work of collecting drawings, by the aid of a syllabus, following the plan of Kerschensteiner's great work, devoted to German children's school drawings. Over 6,000 drawings have already been collected.

The committee devoted to the study of children's mathematical ideas worked most zealously in the year 1910.

The committee on children's language have completed two reports based on the syllabi which brought in a large number of valuable data.

Within the last two years two new large centers for child study have been organized. During the autumn of 1909 a group of teachers opened the Lemberg Paidological Society (Lemberg Swov-Galiga) under the direction of the well-known psychologist Casimir Twardovski, a university professor.

The Paidological Society met each month, lectures were given and syllabi printed, the work being chiefly devoted to the study of abnormal children, though other topics were also studied, *e. g.,* Children's Vocabularies, Children's Drawings, etc.

The Society decided to ask the assistance of the Austrian School Counsel, to create special schools or classes for the abnormal, such as exist in America and Germany. It is supposed that the Austrian School Counsel will give its consent.

This Society has nearly 300 members, consisting mostly of teachers and psychologists, and its work is most vigorous and hopeful.

It has opened several branches which are developing most satisfactorily.

In May, 1911, a paidological section was opened in the old city of Cracovie under the leadership of Dr. Kanavek, Professor J. W. David being a member. Although this Society is still young, it is doing good work and endeavoring to found its researches on an original and scientific basis. As in Lemberg, the Cracovie Society is working with great zeal at the segregation of the abnormal child from the regular schools. The demands of society, home, and the school, emphasize the need of such work, since at present there is no authorized method of distinguishing the normal from the abnormal or undeveloped child. This problem was put before the Austrian School Counsel in Cracovie and an appeal made to open special classes, or *Hilfschulen.*

It is probable that such classes will be opened at the end of the year, that is, with the beginning of the school year, 1912-1913.

This Society has also opened several branches in larger country towns, as Biala, etc., and wants to draw into the movement the 6,000 national or people's teachers, who have to deal with the poor peasantry, and with very many abnormal children. The first problem is to teach

them to discern all sorts of abnormalities, and to free the children from the demands of the school for the normal. The second problem is to gather data for further study.

With increasing interest in child study and psychology, there has arisen a demand for lectures, books, journals, etc., dealing with these subjects, and the need of a psychological laboratory has been demonstrated. This, the first in Poland, was opened in the fall of 1911 at Warsaw. Its director is Professor E. Abramovski, author of the "Studies on Memory," "Theory of Psychical Individuals," etc. The first work published by the laboratory is a report on the study of Subconscious States made by E. Abramovski, under the title of "Experimental Telepathy as a Symptom of Cryptomnesia."

A series of laboratory researches is being devoted to children. For three years Dr. Joteyko, psychologist and leader of the laboratory at Brussels, has been invited to Warsaw and Lemberg, to give a series of lectures, which are eagerly attended. These lectures devoted to the exposition of psychological researches being made in Europe and America.

Professor J. W. David, the author of a New Picture Method for Testing Abnormal Children, published in his book on Intelligence, has given a series of lectures in the largest university auditorium at Cracovie, which were largely attended and awakened a most extraordinary interest.

The year 1911 completed the fifth year of existence of the Polish Child Study Association. Difficulties of a political and financial nature have somewhat hindered its development. Yet there is reason for hope. The Association exists, widens its scope with every year, and has given an initiative to the movement in Poland. It has been so fortunate as to secure interest and help in both Europe and in America, to which it is indebted for the idea of founding its Association. Especially is it most thankful to the American Pedagogical Seminary, to Dr. G. S. Hall, Dr. Theodate L. Smith, and Dr. Louis Wilson for their kindness in printing the reports of the Polish Child Study Association which has been a great help, as through this world known journal interest has been awakened and many of the editors of scientific journals, members of Paidological Societies, and many well known paidologists have addressed the president of the Association, Miss A. Szyc, asking for further information and material, and showing great friendliness and interest. As a result of this, the Pedagogicke Rozhledy, Slavisches Tageblatt, Bund für Schulreform, print reports and longer résumés on the works of Polish psychologists, for which the Polish Child Study Association feels greatly indebted and through the Pedagogical Seminary sends its heartfelt thanks to all its friends in Europe and America.